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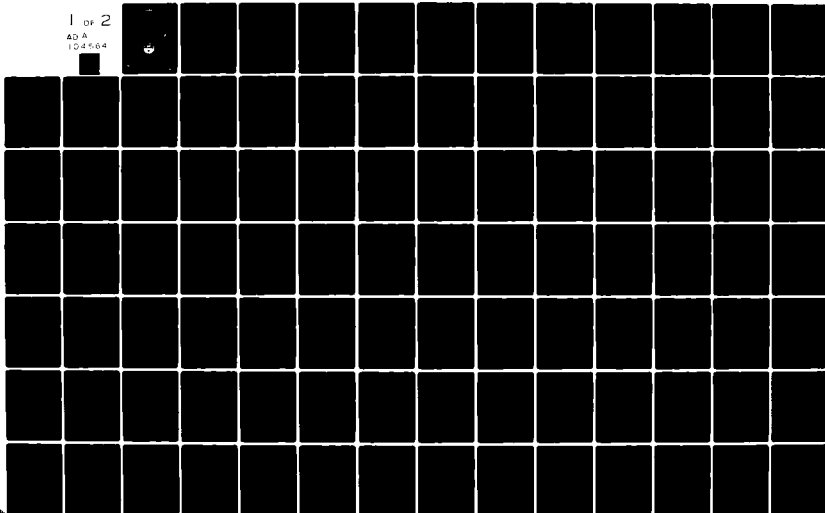
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NPRDC Special Report 81-24

July 1981

**NAVY CIVILIAN (CIVIL SERVICE) BILLET COSTS—FY 1981**

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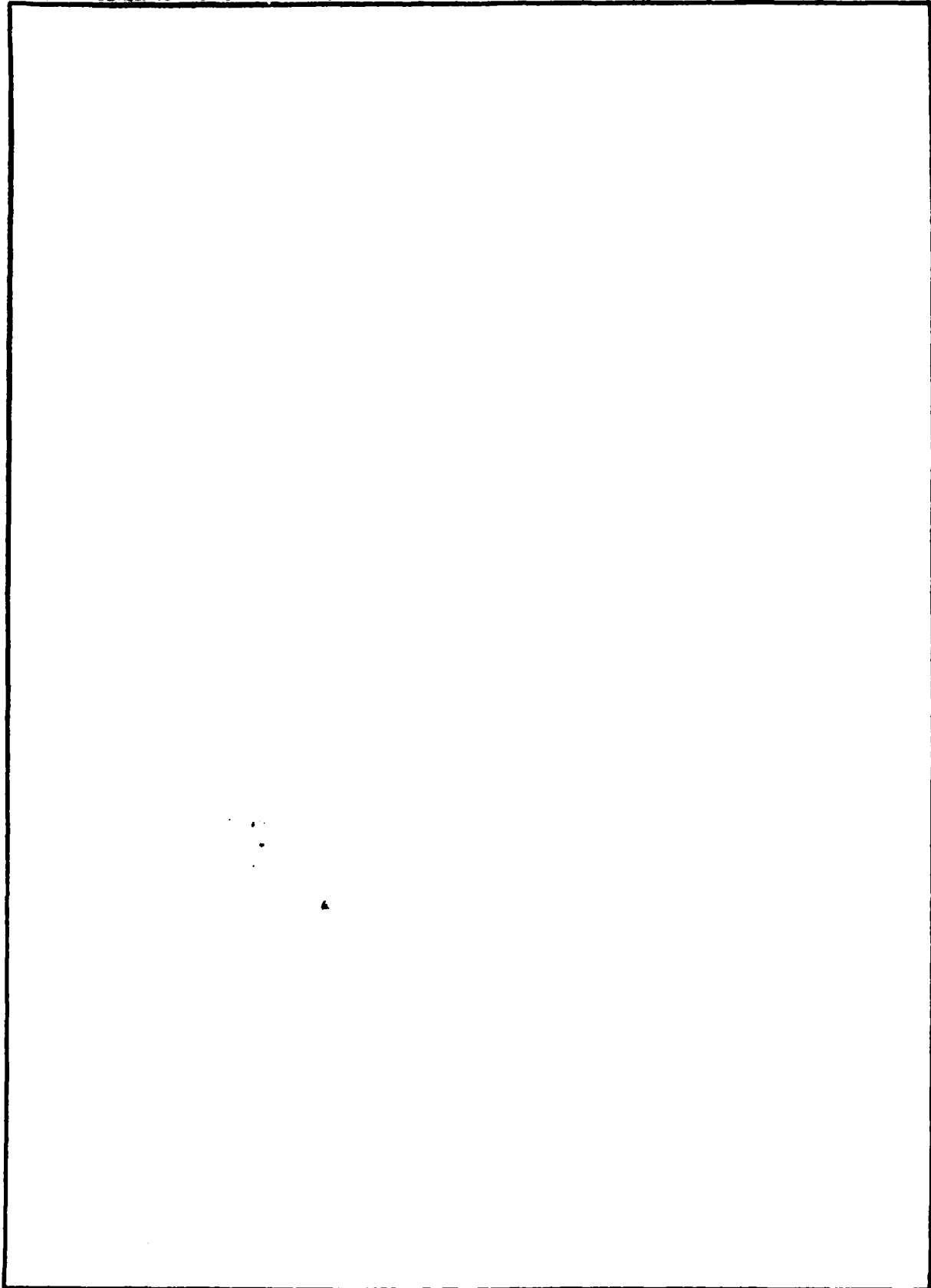
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## FOREWORD

This effort was conducted in support of Navy Decision Coordinating Paper Z1170-PN, subproject Z1170-PN.05 (Reducing Manpower Costs Through Better System Design), and was sponsored by the Deputy Chief of Naval Operations (Manpower, Personnel, and Training, OP-01). The objective of the subproject is to develop techniques for analysis of hardware/software/personnel trade-offs at all stages of system design.

The objective of this effort was to provide decision makers in manpower planning and in hardware development offices with annual and life cycle cost estimates for Navy civilian work force (Civil Service) billets based upon fiscal year 1981 cost data. These data are intended for use in conducting acquisition and life cycle cost estimation studies for new hardware system concepts and alternative manpower support plans.

This report supersedes NPRDC Special Report 80-19, which presented Navy Civil Service billet costs based on FY 1980 data. The billet cost data contained in Appendix C were prepared under contract by The Assessment Group, Santa Monica, California.

Appreciation is expressed to CDR Lee S. Mairs and CDR Paul E. Kanive, of the Economic Analysis Section, Chief of Naval Operations (OP-162), for their assistance as advisors to the development effort.

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## SUMMARY

### Problem

Manpower cost has become a dominant element in the annual defense budget. As these costs have increased over the years, the need for and interest in identifying annual and life cycle manpower costs have also risen. Billet cost models are required for measuring the economic costs of creating or maintaining billets in the Navy's work force and for conducting various cost effectiveness assessments of manpower and hardware-manpower mixes.

### Objective

The objective of this effort was to provide hardware developers and manpower managers with specific manpower cost data for Navy civilian work force (Civil Service) billets.

### Model Description

A Civilian (Civil Service) Billet Cost Model and supporting data base were developed to compute the costs of manning billets with people having requisite qualifications, in terms of the investment and operation cost to the U.S. government, for each year in the life cycle of a given billet. The resulting cost data are displayed for 91 functional occupational groups and pay grades, including both General Schedule and Wage Board positions. These data, which reflect the total cost of manning an established or proposed Navy billet, project costs for 1-, 5-, 10-, 15-, and 20-year periods.

### Conclusion

The cost model documented in this report provides comprehensive cost information that intended users will find useful in determining marginal costs of creating new billets, estimating total costs of Civil Service employees in Navy activities, and comparing the cost of civilian billets and military billets for the same or similar work.

### Recommendation

Hardware developers and cost analysts should use the annual and life cycle cost information presented in Appendix C for those studies where Civil Service manpower costs are to be considered in manpower acquisition and management, or in the design and selection of hardware acquisition.

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## INTRODUCTION

### Problem

Manpower cost has become a dominant element in the annual defense budget. As defense costs have increased over the years, the need for and interest in identification of annual and life cycle manpower costs have also increased. Billet cost models are needed to measure the economic costs of creating or maintaining billets in the Navy's work force and to conduct various cost effectiveness assessments of manpower and hardware-manpower mixes. The development of such cost models is one of several major objectives of subproject Z1170-PN.05 Reducing Manpower Costs Through Better System Design, under which this work was conducted.

### Background

The Civilian Billet Cost Model represents the fourth in a series of such cost models developed for Navy use. Earlier models include the Enlisted Billet Cost Model, the Reserve Billet Cost Model, and the Officer Billet Cost Model (Koehler, 1981, 1980a and b). To the maximum extent possible, these models have all been developed to maintain compatibility of the programming and data bases, thus enabling cross model comparison of billet costs when desired by model users.

### Objective

The objective of this effort was to provide hardware program managers, manpower managers, and cost analysts with specific annual and life cycle billet cost estimates based on FY81 data for all Navy Civil Service billets. This information is intended to enable users to make decisions by (1) weighing costs of candidate systems and support concepts that may be more manpower-intensive against those that may be less manpower-intensive, (2) comparing hardware, software, and manpower costs of such approaches, and (3) comparing costs of various manning mixes involving military, Civil Service, and contract-supplied personnel options.

This report supersedes NPRDC Special Report 80-19 (Koehler, 1980b), which presented Navy Civil Service billet costs based on FY80 data.

## MODEL DEVELOPMENT

A computer-based Civilian Billet Cost Model (CBCM) was constructed and its supporting data files were established. Using these files, the computer program combines the data and computes costs of manning existing or proposed billets with individuals of given occupational groups and pay grades. Data were collected for both General Schedule (GS) and Wage Board (WB) billets. Investment and operation costs that the government must incur in creating and supporting each billet were established and are presented in 1, 5, 10, 15, and 20-year increments.

Basically, the CBCM is a set of computer programs that estimates the costs associated with creating and staffing Civil Service billets within the Navy. The software transforms basic personnel inventory and manpower cost information into the cost model information file, the retirement file, and the demographic file used in the cost computation process. The programs were written in BASIC, FORTRAN, PL-1, and machine language, depending on the computer used for transformation. The model is compatible with IBM 360/168 computer systems and will reside within the Chief of Naval Operations (OP-110).

The CBCM is intended to be used for (1) estimating the marginal costs of creating a new billet specified by grade and broad occupational category, (2) estimating the total costs of the Civil Service employees of the Navy or major subgroups, and (3) comparing the cost of civilian billets and military billets for the same work when used with the Enlisted and Officer Active and Reserve Billet Cost Models.

### Limitations

The CBCM is a static model with regard to individuals. Much of the detail in the military billet cost models depends upon the aging of a population that enters the force at Length of Service (LOS) 0 and rank E-1 or O-1. The CBCM problem is more complex because of lateral hires: the appearance of individuals with LOS 0 and well distributed grades and pay levels. The progress of individuals through the pay levels and occupational groups is very difficult to track. For this model, an assumed interbillet turnover rate was set at 20 percent per year, corresponding to an average duration in any billet of 5 years.

Compromises in computational methods were required at several stages because of data problems as well as the static structure discussed above. In some cases, data sources could not be sufficiently identified to allow the distribution of certain costs over billets. These elements were therefore committed to overhead pools of various descriptions, depending on the distributional information that was available.

### Data Base

The data base for the model was developed from a variety of sources. The most important of these were the Defense Manpower Data Center (DMDC) Master and Training Files and a variety of published and unpublished papers provided by the Office of Personnel Management (OPM) of the Civil Service Commission. The DMDC files provided specific information for every Navy Civil Service employee, while OPM publications yielded age-specific data for the Civil Service as a whole.

The methods and sources used to compute cost elements of the data base are discussed in the following paragraphs; the sources are listed in Appendix A. In every case, the cost elements were processed before being added to the formal data file. In some cases, the processing was simple (e.g., for base pay, which is a mean for all people appearing in a given cell); in other cases, it was quite complex (e.g., for recruitment costs).

#### Base Pay

Base pay is based on data in the DMDC 1979 Master File that covers all Navy Civil Service employees. These data were adjusted to reflect the 7 percent pay increase of 1979-1980 and the 9.1 percent increase of 1980-1981. The annual maximum base pay ceiling was set to \$50,113. The General Schedule (GS) is the basis for setting pay rates for GS employees. It includes 18 major divisions (grades), each of which contains 10 subsidiary divisions (steps).<sup>1</sup> For Wage Board (WB) employees, rate schedules are devised for every local area in which they are hired so that wage rates are competitive within the local markets. Since there are 138 wage areas covered in the model's data base, as well

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<sup>1</sup> The model does not cover either Executive level positions or the Senior Executive Service introduced by the Civil Service Reform Act of 1978 (PL95-454, 13 Oct 1978). Some implications of the new law for future versions of this cost model are discussed in the Conclusions section of this report.

as many non-U.S. areas that could be included, a weighted average approach to WB costing was employed for simplicity and ease of use by the reader. This approach provides a single base pay rate for individuals within the same occupational group and at the same grade and pay plan. The weighted average is based on the distribution and size of wage area differentials within each cell.

In addition to the regional variations, WB employees are classified in 1 of 26 pay plans, most of which have resulted from special union wage scales or specific laws governing the compensation of workers employed in overseas regions. For use in this model, the 26 pay plans were reclassified to fit into the following categories: (1) apprentices, (2) general laborers, (3) wage leaders, (4) supervisors, (5) nonsupervisory scheduling employees, and (6) supervisory scheduling employees. In general, the wage schedules increase for each group in the order given. Pay plans (4) and (6) were then combined to reduce user confusion in attempting to distinguish between the two supervisory plans. This leaves five pay plans for costing purposes in the CBCM.

DMDC aggregates individual GS and WB occupational fields into 91 Functional Occupational Groups (FOGs)--24 GS categories and 67 WB categories. This aggregation creates larger career groups that provide greater stability for mathematical computations and DMDC forecasting needs. For these same reasons, the FOGs were adopted for identifying billets and costs in the CBCM. Tables for use in converting GS and WB series to FOGs are provided in Appendix B; and specific billet cost data for FOGs, in Appendix C.

#### Premium Pay

Premium pay data were obtained from special analyses prepared by the personnel departments at the Naval Shipyard (NSY), Long Beach and the Naval Air Rework Facility, North Island (NARFNI), San Diego. The analyses provided detailed information on the distribution and number of premium hours worked, by grade, in these facilities. While this information is not necessarily representative, especially in the case of GS employees, it does provide a basis for preliminary computation and indicates a feasible method for future computations. An additional source of data was the navy Comptroller's Office, which provided 1979 summary data--by GS and WB employees--on total expenditures in each of the premium pay categories.

For this cost element, the total budget cost of premium pay between GS and WB employees and among grades was distributed based on the sample distributions from San Diego and Long Beach. This was done separately for three types of premium pay: overtime, holiday, and Sunday. The first type is paid at 1½ times the base pay rate; and the others, at 2 times the base pay rate. Other premium pay, such as nightwork differential, hazardous duty, and overseas differential, were distributed on a per capita basis.

#### Retirement

Several forms of retirement benefits are financed through the Civil Service Commission retirement fund. The principal income of the fund is a compulsory contribution by employees, currently amounting to 7 percent of base pay. Benefits include a regular retirement policy, disability retirement, survivor policies, deferred retirement, and the ability to cash out of the policy at any time before retiring.

In computing retirement costs, both contributions and disbursements must be considered. To estimate the net accrual of government obligations at a given time,

contributions and disbursements must be compared to each other relative to the current value of contributions and cost of alternative retirement streams. This was done by determining:

1. The size of the fund (on hand) necessary to finance all government obligations to an individual that can arise immediately or at some time in the future.
2. The size of the fund accrued by the government from the employee's contributions, with interest, which is available to defray the cost.
3. The cash-out value of the fund.

Computations were made to consider the current value of past contributions in cases where contribution rates, yield rates, and interest rates have varied significantly from the 1940s to the present. In addition, looking to the future, a weighted average of costs associated with the possible retirement options was computed. The weights represent probabilities of each of the following occurrences:

1. Regular retirement for an employee with survivor benefits (males only).<sup>2</sup>
2. Regular retirement without survivor benefits.
3. Deferred retirement with survivor benefits (males only).<sup>2</sup>
4. Deferred retirement without survivor benefits.
5. Disability retirement with survivor benefits (males only).<sup>2</sup>
6. Disability retirement without survivor benefits.
7. Death during service with survivor benefits (males only).<sup>2</sup>
8. Lump sum settlement (death without survivor and cash-out options combined).

Additional computational considerations were required to establish net retirement costs within a given year. For example, when an individual leaves government service, he receives money from the retirement fund, the amount of which varies as a function of the departure condition. If all of the funds accrued by the government from the employee's contributions, with interest, are not required, two things may happen. Either the full balance reverts to the government, or a portion of it goes to the individual or his estate and the remainder goes to the government. The simplest case is that of a cash-out, where the individual gets the current cash-out value of the fund and the balance reverts to the retirement fund. If an annuity stream is paid out but ends early, anything left in the obligation fund goes to the estate of the deceased. In this event, the remainder goes to the government's retirement fund. This is an important point, for, if individuals remain in Civil Service beyond their eligible retirement point, their yearly cost to the government decreases dramatically (e.g., see p. C-5, Table 2-200, Grade 16). This decrease is due to the decreased life expectancy of the individual, which results in a reduced financial burden to the retirement fund.

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<sup>2</sup>Since female expectations of life always exceed those of males, the computation technique applied to females would yield no difference between survivor benefits or no survivor benefits, except for a lower initial annuity.

Finally, if the size of the fund accrued by the government from the employee's contributions, with interest, is less than the obligations to the individual, the balance represents a net cost to the government. In this case, the retirement fund must make up for the deficit.

In computing the costs of retirement to the individual billet, each of the above factors was considered mathematically. The end results were then combined into a weighted average retirement cost for a billet.

#### Life Insurance

The Federal Employees' Almanac and DMDC's Navy Civilian Master File for FY79 were the primary sources for estimating life insurance costs.

Although the Federal Employees Group Life Insurance is an optional benefit, most employees choose to take out at least the regular coverage. For that coverage, the employee pays two thirds of the premium; and the government, one third. For any additional coverage, the employee pays the full amount.

The general rule for regular coverage is that the level of coverage is equal to the employee's yearly salary plus \$2000 rounded to the next highest thousand. Regular coverage must be at least \$10,000 and no more than \$60,000.

The average salary within each FOG/pay grade cell (FOG/Pay Grade) and the percent of individuals choosing either regular or additional coverage was determined by analyzing Master File data. The employee's biweekly premium and the government's contribution were then established using the Federal Employees' Almanac.

#### Training

DMDC's Master and Training Files were used to obtain training cost estimates. The Training File provided data for 1976 (the most recent available); and the Master File, data for both 1976 and 1979. Using the standard for 1979, adjustments were made to accommodate the differences in the dates between the Training and Master Files.

An additional adjustment was made to compensate for all size changes from the 1976 to 1979 data bases. Next, the data from the Training and Master Files were merged, resulting in several variables of interest including on-duty training hours, off-duty hours, tuition costs (called direct costs), and travel and subsistence costs (called indirect costs).

Additional processing of the data provided training costs by eight Major Occupational Groups (MOGs), which were created by combining all FOGs having the same first digit. This further combining of FOGs was necessary because of the small numbers problem. With very small numbers of employees receiving training, their individual training costs often represent unique costs specific to the individual. Their costs can be misleading when used to project average future costs for a career group. To prevent this, it often is necessary to further combine personnel to form larger groups--in this case, MOGs.

Table 1 provides training costs for the eight MOGs; the FOGs included within each are presented in Table B-1, Appendix B. When these values are multiplied by the sum of on- and off-duty training hours, the result is total tuition costs by GS or WB FOG cell. This amount was added to the total indirect costs (travel and subsistence costs) and the sum adjusted by the cost-of-living increases for 1976 to 1980 (51.9% for the 4 years).

Table 1  
Tuition Cost Per Hour by Major Occupational Group (MOG)

MOG Code	Title	Tuition Cost per Hour of Training
1	Scientists and Engineers	8.33
2	Other Professionals	7.64
3	Management and Administration	6.20
4	Technicians and Subprofessionals	5.53
5	Clerical	3.78
6	Service	1.73
7	Craftsmen, Mechanics, and Production	5.05
8	Laborers and Operators	3.46

#### Recruitment

Recruiting costs include initial and recurring elements. Initial costs are those involved in establishing a new billet, preparing the position description, obtaining budgeting authority, and so on. Recurring costs include those involved in advertising an opening, interviewing applicants, considering resumes, selecting an applicant, and preparing the formal offer. Virtually no data could be found through either DMDC or other groups that measure these costs. Although a gross estimate of per capita screening costs for new personnel was obtained from the Civil Service Commission, virtually all other costs mentioned above are borne by Navy personnel offices and are not reflected in the screening cost element.

To establish a rough estimate of recruiting costs, interviews were held with personnel office representatives at the Navy Personnel Research and Development Center (NAV-PERSRANDCEN), NARFNI, San Diego, and NSY, Long Beach. While interviewees could not provide sufficient data for developing reliable estimates of the relevant values, they did provide enough information to structure the cost relations. The significance of the resulting data is therefore indicative of the costs to be anticipated rather than authoritative with regard to their absolute values.

The computation uses two variables--the number of hours required to establish a billet and the number of hours required to fill a vacancy. For GS personnel, the hours consumed are valued at the full billet cost of the GS level expected to perform the administrative labor. Values used for costs to set up a billet run from 1 hour for a GS-1 to 6 hours for super grades (GS-16 to GS-18). Values for the costs of filling a vacancy run from 2 hours to 46 hours over the same source range. Each billet is costed at a billet cost two grades higher within the same FOG--see Table 2.

Table 2  
GS Recruiting Responsibility by Grade

Grade to be filled	Grade Used for Time Cost
1-5	7
6	8
7	9
8	10
9	11
10	12
11	13
12	14
13	15
14	16
15	17
16-18	18

For WB employees, a different method was used. Because the FOGs for WB employees are broken into five groups (i.e., apprentices, general laborers, wage leaders, supervisory/scheduling, and nonsupervisory/scheduling), it was necessary to cost recruiting time across groups. The scheme of time valuation is as shown in Table 3.

Table 3  
WB Recruiting Responsibility by Pay Plan Aggregate

Billet to be Filled	Billet Used for Time Cost
Apprentice	Wage Leader
General Labor	Wage Leader
Wage Leader	Supervisory/Scheduling
Nonsupervisory/Scheduling	Supervisory/Scheduling
Supervisory/Scheduling	By WB level: Two grades higher
Special Functional Occupational Group <sup>a</sup>	Supervisory/Scheduling

<sup>a</sup>Lithographic Production Workers (FOG-795) and Marine Vehicle Operators (FOG-805) are included in this group because their pay schedules fall outside the normal WB pay schedule scheme.

The calculations conducted using the above information for GS and WB billets provide both initial and recurring recruiting costs. For the latter to be meaningful, it was necessary to estimate the frequency with which the billet must be filled during its life cycle. This again was a crucial value for which no direct data could be obtained. Since, as noted previously, a 20 percent per year turnover rate was assumed, a 5-year average period in any billet was set for the model and used in recruitment calculations.

### Injury Benefits

The primary data sources used to estimate injury benefits (Workmen's Compensation) were the Navy FY79 Injury Report by Cause/Occupation, the Department of the Navy Man-year and Cost Report, FY79, and employee population counts, obtained from the DMDC 1979 Master File. This cost element is not to be confused with the disability benefits paid to eligible employees under the Civil Service Retirement Act. With few exceptions, compensation for disability cannot be paid concurrently with a disability retirement annuity. If an individual qualifies for both, he must choose between the two. The benefits referred to here are commonly known as workmen's compensation payments made under the Federal Employee's Compensation Act (FECA).

The Injury Report cited above was processed to identify disability costs with specific occupations used in the model. To determine the expected cost per incident, the total disability cost figure was divided by the total number of disability claims on the Injury Report. To obtain the total cost of disability by FOG, the injury count per FOG was multiplied by the average cost per incident. This total was then spread over the entire FOG population to obtain an expected cost of disability per individual in that occupational group.

### Overhead Costs

Overhead costs are those that, due mainly to insufficient data, cannot be allocated to a specific FOG or pay level. Therefore, they are distributed evenly among all Navy civilians. Included in this category are the following: health insurance costs, severance costs, permanent change of station costs, unemployment benefits, and such costs as overseas allowances for U.S. civilians, payment of benefits under special plans to noncitizens in foreign countries, uniform allowances, and awards.

### Downtime

Downtime computations were based on the full-time work year of 2080 hours, corresponding to 52 40-hour weeks. Compensation is provided for the several sources of downtime:

1. Holidays
2. Vacations
3. Sick Leave
4. Administrative leave
5. Other earned leave
6. Continuation pay
7. Travel time
8. Other nonproductive time

Within the CBCM, direct data have been assembled on the first six sources listed only. In computing downtime hours for each FOG/pay grade, annual leave was considered as a factor of length of service, every cell was allocated 72 hours of regular holiday downtime, and the sum of all hours used in administrative, other earned leave, sick leave, and continuation pay was distributed across all Navy civilian employees.

Butler and Cylke (1981) provide more comprehensive information concerning the technical aspects of the CBCM.



## NAVY CIVIL SERVICE BILLET COSTS

Appendix B contains tables for translating General Schedule and Wage Board series to Functional Occupational Groups (FOGs); and Appendix C, specific cost data for billets arranged by FOGs.

### Appendix Use

In computing billet costs using the CBCM, the user must first determine whether a GS or WB billet will be needed. The next requirement is to select the specific occupational group and series of interest. For example, if the billet being considered requires the support of an Electronics Mechanic--General Labor (WB 2614), the user would refer to Appendix B, Table B-1, and find that this series is included in MOG 7, "Craftsmen, Mechanics, and Production." The FOG number is a combination of the MOG number and the number assigned to the series of interest--in this case, 7.0. The user then turns to Table B-2, page B-14, which lists all occupational codes contained within this FOG. As shown in Appendix C, pages C-31 through C-35, FOG 70 is identified with five pay plans, 700, 701, 702, 703, and 704, which provide billet cost data for apprentice, general labor, wage leader, nonsupervisory/scheduling, and supervisory pay plans respectively.

### Cost Computation

When the user finds the billet cost table for the position of interest, he must determine the number of billets needed, the pay grades required, and the number of years--either in the life cycle of the system being supported or the life cycle of the billet to be filled. To illustrate, assume the user decides that (1) one WB 2614 Electronics Mechanic--General Labor (FOG 701) at pay grade 10 will be required for each of three locations, and (2) the positions will have a life expectancy of 10 years. The life cycle costs for this WB position are provided in Table 2-701, page C-32. Reading across the table for pay grade 10, we find that the initial billet cost, which represents the one-time cost which the government will incur in establishing a new billet is \$321. This amount covers preparation of the position description, classification of the position, obtaining budgeting authority, etc. By using the figures representing billet costs for 1-, 5-, 10-, 15-, and 20-year time periods, costs for the desired billets can be identified, as noted in the following example.

GS/WB	FOG	Pay Grade	Life Cycle	Cost Per Billet (10 years)	+	Initial Billet Cost	x	Number Billets	=	Total Cost
WB	701	10	10 yrs	\$201,048	+	\$321	x	3	=	\$604,107

### Discount Rate Computation

The 1-, 5-, 10-, 15-, and 20-year billet cost figures included in Appendix C have been computed using a 10 percent discount rate. According to the Office of Management and Budget Circular A-94,<sup>3</sup> this discount rate must be applied when projecting costs into future years. Thus, the costs in the example provided above have been computed to

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<sup>3</sup>Office of Management and Budget Circular A-94. Subj: Discount rates to be used in evaluating time, distributed costs, and benefits.

reflect this discount rate. In the computation process, the discount rate has been applied to each of the 26 Civil Service pay periods in each year except for pay period one in year one. If the user does not desire to use discounted costs, the Initial Billet Cost and Annually Recurring Cost figures can be used. From the previous example (using Table 2-701 of Appendix C), the figures \$321 and \$31,630, which represent undiscounted costs of the billet at pay grade 10, can be used to compute undiscounted costs based on the following formula:

$$C_n = AN + I$$

where

- C = Billet cost
- n = Number of years in billet life
- A = Annually recurring cost
- I = Initial billet cost

For example, the undiscounted billet costs for the WB 2614 Electronics Mechanic--General Labor (FOG 701), pay grade 10, for a 10-year period have been computed using the following values:

- n = Number of years in billet life = 10
- A = Annually recurring cost = \$31,630
- I = Initial billet cost = \$321

WB 2614-10  
 10-year billet cost = \$31,630 x 10 + \$321  
 = \$316,621 per billet  
 or \$949,863 for three billets

## DISCUSSION

There are two main sources of change between the billet costs generated by the CBCM for FY80 and FY81. First, changes have been made in the retirement computation and second, most prices have risen. The composition of the Civil Service is also different, of course, so that individual billets may, in some cases, have changed in ways that can be explained only by changes in the characteristics of their occupants. This will be especially noticeable in the very small population cells where, for example, the departure of a single individual could have a profound effect.

Changes arising from the new retirement algorithm have caused most billet costs to rise slightly and some to fall drastically. Rather than treating those who survived a year and remained in the service as deferred retirees, as was done in the previous report, the present algorithm treats them more realistically as employees who will retire with a certain probability at a stochastically determined age. The effect of this change is to raise very slightly the imputed retirement cost for most career years up to those combinations of age and LOS that qualify an individual for immediate retirement. In those infrequent cases (e.g., age 55 at LOS 30), last year's model was sharing a marginal cost for a single year of service of \$150,000 to \$250,000. Now it shows a cost only slightly larger than those for other years because of the forecast date of retirement.

Another change introduced this year was to set the Civil Service Commission yield rate estimate for future time periods back to 5 percent from the 10 percent used last

year. This raised all retirement costs slightly. The reader will note that in Appendix C many billets still show negative retirement costs. These are properly interpreted as net benefits to the government. They are explained by the fact that individuals populating those billets have, on the average, contributed enough to the fund during the current year so that, with interest, the government can more than pay for its increased obligations arising from an additional year of service.

Price change is the major source of difference. The main change is an increase in the federal pay scale of 9.1 percent, including a 5.5 percent increase in the top salary that can be earned. These increases have an impact throughout the model on cost elements that are wholly or partly dependent on base pay. In addition, such elements as the tuition and other nonlabor components of training cost rose by the amount of the consumer price index in 1980, as did overhead cost, recruiting cost (fixed component), and injury benefits.

### CONCLUSIONS

1. The CBCM differs significantly from its predecessor military cost models in that civilians are hired into Civil Service at all pay levels and occupational groups, while the military acquires most of its personnel at entry-level positions and pay rates.

2. As a result of the Civil Service Reform Act of 1978, significant changes have been introduced into the Civil Service system. In some cases, it will take several years before the effects of these changes are accurately reflected in record files such as used in construction of the data base for this cost model. Of the changes introduced by the Reform Act, the most easily modeled will be the dropping of super grades in favor of the Senior Executive Service. It will be several years, however, before the impact of merit step increases have made their full impact on the average characteristics of pay levels within the several occupational categories for GS employees.

### RECOMMENDATIONS

Hardware developers, manpower planners, and cost analysts should use annual and life cycle billet cost information contained in Appendix C in studies where Civil Service manpower costs are to be considered in the design or selection process of hardware acquisitions, manpower systems, or organizational concepts. Specific applications should include (1) conducting trade studies, such as costing various manning concepts involving numbers, mixes of skills, or types of manpower, (2) comparison of manpower versus hardware costs for both initial acquisition and life cycle support, and (3) comparing various maintenance support options.

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- Butler, R. A., & Cylke, S. C. Civilian billet cost model, Volume I (PR-A102). Santa Monica: The Assessment Group, March 1981.
- Koehler, E. A., & Turney, R. F. Life cycle Navy enlisted billet costs--FY1981 (NPRDC Spec. Rep. 81-22). San Diego: Navy Personnel Research and Development Center, July 1981(a).
- Koehler, E. A. Life cycle Navy officer billet costs--FY81 (NPRDC Tech. Rep. 81-12). San Diego: Navy Personnel Research and Development Center, June 1981(b).
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- Koehler, E. A. Navy civilian (Civil Service) billet costs--FY1980: An interim report (NPRDC Spec. Rep. 80-19). San Diego: Navy Personnel Research and Development Center, May 1980(b).

**APPENDIX A**  
**CIVILIAN BILLET COST MODEL DATA SOURCES**

## CIVILIAN BILLET COST MODEL DATA SOURCES

### Base Pay

1. Navy Civilian Master File, FY 1978, Defense Manpower Data Center (DMDC), Monterey, CA.

### Premium Pay

1. Department of Navy, Manyear and Cost Report, FY 1979. For specific budget data on premium pay expenditures for GS and WB personnel.
2. Payroll analysis, Comptroller's office, Long Beach Naval Shipyard. Data on incidence of overtime by grade, pay plan for WB and GS personnel.
3. Payroll analysis for Naval Air Rework Facility, North Island, Naval Finance Center, San Diego, CA. Data on overtime incidence for personnel working in the NARF.
4. Federal Employee's Almanac, 1980. General information on qualifications and restrictions for premium payments.

### Retirement

1. "Board of Actuaries of the Civil Service Retirement System Fifty-Second Annual Report," House Document No. 94-203, U.S. Government Post Office (USGPO), Washington, DC., 1975. Source for yield on CSRS investments and interest paid on employee contributions.
2. Federal Fringe Benefit Facts, 1979. U.S. Civil Service Commission, Washington, DC., 1980. For data on the requirements and actuarial formulas of the Civil Service Retirement system. Also, CSRS trend tables.
3. Federal Employees' Almanac, 1980. Source for determining and computing employee contributions, eligibility requirements for different annuities, and the size of annuities.
4. "Fiftieth Annual Report of the Board of Actuaries of the Civil Service Retirement System," House Document No. 93-37, Washington, DC., USGPO, 1973. Contains tables on probabilities of certain events occurring to employees of given LOS, age, and sex.
5. "Refund Study," unpublished manuscript, Office of the Actuary, Office of Personnel Management (OPM), 1968. For data on the probability of cashing out of retirement system given age and LOS characteristics.
6. Statistical Abstract of the United States, 1979. Department of Commerce, Washington, DC., USGPO, 1979. Contains demographic tables used to determine probable marital and family status of employees.
7. Civilian Master File, FY 1979. For FOG/GS cell data on age, LOS, and salary distributions.
8. Laws Relating to Civil Service Retirement. USGPO, Washington, DC., 1976. General Source of all information on the mechanics of the Civil Service Retirement system.

### Life Insurance (FEGLI)

1. Federal Employee's Almanac, 1980. Contained insurance tables, premium rates.
2. Master File, FY 1979, DMDC. Used for estimating the within-cell probability of taking life insurance.

### Training

1. Civilian Training File, FY 1976, from DMDC. Office of Personnel Management, Washington, DC. Data on hours of training, tuition, and travel costs.
2. Civilian Master Files, FY 1976 and FY 1979, DMDC. For data on FOGs of trained employees, employee salaries, and population counts.
3. National Economic Trends. Federal Reserve Bank of St. Louis, 31 July 1980. GNP deflators used in updating 1976 cost data.

### Recruitment

1. Recruitment Division, Office of Personnel Management. Budget data used to develop overhead component of recruitment cost.
2. Navy Personnel Research and Development Center, Personnel Office. Informal data on downtime element of recruitment including interviewing, evaluation, position description writing, etc.
3. Long Beach Naval Shipyard, Personnel Office. Data on recruitment of LBNS General Schedule personnel.
4. Long Beach Naval Shipyard, Employment Division. Data on recruitment procedures and costs of Wage Board and General Schedule personnel.

### Injury Benefits

1. Navy CY 1979 Injury Reports by Cause/Occupation. Department of Labor (NDOL), Washington, DC. Records of injury incidence by occupation.
2. Department of Navy, Man-year and Cost Report, FY 1979. Office of the Comptroller, Washington, DC. Budget outlays for FECA (to the Department of Labor) to pay for injury benefits.
3. Civilian Master File FY 1979, DMDC. For cell population sizes to generate average injury benefits.

### Overhead Costs

#### Health Insurance

1. Federal Fringe Benefit Facts, 1978. Tables D-8, D-9. Used in computing weighted average health insurance premiums.
2. Federal Employees' Almanac, 1980. Data on rules governing employee/federal contributions to premium payments.

#### Severance Pay, PCS Costs

1. Department of Navy, Man-year and Cost Report FY 1978 (Exhibit B-1). For budget amounts used in generating overhead constants.
2. Civilian Master File, FY 1978. Employee population counts.

#### Unemployment Costs

1. United States Department of Labor, Sixty-Sixth Annual Report, FY 1979 (p. 148). Source of data on average length of benefit period and benefit amount.
2. Unemployment Insurance Statistics. U.S. Department of Labor, Employment, and Training Administration, October-December 1979. Data for generating unemployment rate for federal employees under UCFE program.

#### Other Overhead Costs

1. Department of Navy, Man-year and Cost Report, FY 1979 (Exhibit B-1). Budget figures on payments to foreign employees, overseas benefits, uniform allowances, and superior performance awards.
2. Civilian Master File, FY 1978. Employee population counts.

#### Downtime Costs

1. Federal Employees' Almanac, 1978. Source for rules on annual, sick, and other leave components.
2. Department of Navy, Man-year and Cost Report, FY 1978 (Exhibit D-1). Total incidence of leave for civilians.



**APPENDIX B**

**CONVERSION TABLES--GENERAL SCHEDULE/WAGE BOARD  
TO FUNCTIONAL OCCUPATIONAL GROUPS**

Table B-1

## Major and Functional Occupational Groups Used in CBCM

Major Occupational Group	Functional Occupational Groups Include:
1. Scientists and Engineers (GS)	0 Scientists 1 Engineers
2. Other Professionals (GS)	0 Mathematicians 1 Medical 2 Legal 3 Educators 4 Miscellaneous
3. Management and Administration (GS)	0 Logistics Management 1 Personnel Management 2 Financial Management 3 Data Systems Management 4 General Management
4. Technicians and Subprofessionals (GS)	0 Scientific and Engineering Technicians 1 Medical Technicians 2 Logistics Technicians 3 Management Technicians 4 Miscellaneous
5. Clerical (GS)	0 Secretarial 1 Financial Clerks 2 Logistics Clerks 3 General Office Operations 4 Miscellaneous
6. Service (GS/WB)	0 Medical Attendants (GS) 1 Fire and Police (GS) 2 Personnel Services (GS/WB)
7. Craftsmen, Mechanics, and Production (WB)	0 Electronics Mechanics 1 Electricians 2 Machine Tool Operators 3 Metal Workers 4 Aircraft Mechanics 5 Pipefitting Workers 6 Woodworkers 7 Marine Equipment Repairmen 8 Miscellaneous Mechanics and Repairmen 9 Miscellaneous Production Workers
8. Laborers and Operators (WB)	0 Vehicle Operators 1 Logistics Workers 2 Installation Maintenance

Table B-2

Civil Service Occupational Series Included  
in Functional Occupation Groups

FOG		CSC Series Included
<b>1. Scientists and Engineers</b>		
<u>1.0 Scientists (GS)</u>		
Psychologists	180	Psychology
Biological Scientists	401	General Biological Science
	403	Microbiology
	405	Pharmacology
	406	Agricultural Extension
	410	Zoology
	413	Physiology
	414	Entomology
	430	Botany
	434	Plant Pathology
	435	Plant Physiology
	436	Plant Quarantine
	437	Horticulture
	440	Genetics
	454	Range Conservation
	457	Soil Conservation
	460	Forestry
	470	Soil Science
	471	Agronomy
	475	Agricultural Management
	480	Fish and Wildlife Administration
	482	Fishery Biology
	485	Wildlife Refuge Management
	486	Wildlife Biology
	487	Husbandry
	493	Home Economics
	701	Veterinary Science
Chemist	1320	Chemistry
	1382	Food Technology
	1384	Textile Technology
Metallurgist	1321	Metallurgy
Geology and Geophysics	1313	Geophysics
	1315	Hydrology
	1350	Geology
	1372	Geodesy
Oceanographer	1360	Oceanography
Cartographer	1370	Cartography
Physicist	1310	Physics

Table B-2 (Continued)

FOG	CSC Series Included	
1. Scientists and Engineers (Continued)		
Physical Science (not elsewhere classified)	1301 1306 1330 1340 1373 1380 1386	General Physical Science Health Physics Astronomy Meteorology Land Surveying Forest Products Technology Photographic Technology
1.1 Engineers		
Architects	808	Architecture
Aerospace Engineer	861	Aerospace Engineering
Chemical Engineer	892 893	Ceramic Engineering Chemical Engineering
Civil Engineer	810 819	Civil Engineering Sanitary Engineering
Naval Architect	871	Naval Architect
Electrical Engineer	850	Electrical Engineering
Electronic Engineer	855	Electronic Engineering
Industrial Engineer	896	Industrial Engineering
Mechanical Engineer	830	Mechanical Engineering
Welding Engineer	806 894	Materials Engineering Welding Engineering
Nuclear Engineer	840	Nuclear Engineering
Engineers (not elsewhere classified)	801 803 804 807 858 880 881 890	General Engineering Safety Engineering Fire Prevention Engineering Landscape Architecture Biomedical Engineering Mining Engineering Petroleum Engineering Agriculture Engineering
2. Other Professionals		
2.0 Mathematician (GS)		
Mathematician	1520	Mathematics
Statistician	1510 1529 1530	Actuary Mathematical Statistician Statistician

Table B-2 (Continued)

FOG		CSC Series Included
<b>2. Other Professionals (Continued)</b>		
Operations Research Analyst	1515	Operations Research
<u>2.1 Medical (GS)</u>		
Professional Nurse	605 610 615	Nurse Anesthetist Nurse Public Health Nurse
Physician	602	Medical Officer
Health Professional (not elsewhere classified)	601 630 631 633 635 637 639 644 660 662 665 668 680 690 696	General Health Science Dietician Occupational Therapist Physical Therapist Corrective Therapist Manual Arts Therapist Educational Therapist Medical Technologist Pharmacist Optometrist Speech Pathology Podiatrist Dental Officer Industrial Hygiene Food and Drug Inspector
<u>2.2 Legal (GS)</u>		
Lawyers	904 905 935 942	Law Clerk General Attorney Administrative Law Judge Deport. and Excl. Examining
Patent Advisor	1210 1220 1221 1222 1223 1224 1225 1226	Copyright Examining Patent Administration Patent Advisor Patent Attorney Patent Classifying Patent Examining Patent Inter. Examining Design Patent Examining
<u>2.3 Educators (GS)</u>		
Educator	1701 1710 1720 1725	General Education and Training Education and Vocational Training Educational Research Public Health Educator

Table B-2 (Continued)

FOG	CSC Series Included	
2. Other Professionals (Continued)		
2.4 Miscellaneous Professional (GS)		
Intelligence Specialist	132 1540	Intelligence Cryptography
Librarian	1410 1420	Librarian Archivist
Public Information	1081	Public Information
Professional (not elsewhere classified)	020 050 060 101 110 120 130 131 135 136 140 150 170 184 185 190 193 246 1015 1169	Community Planning Funeral Director Chaplain Social Science Economist Food Assistance Specialist Foreign Affairs International Relations Foreign Agriculture Affairs International Cooperation Manpower Research Geography History Sociology Social Work Series General Anthropology Archeology Contractor Industrial Relations Museum Curator Internal Revenue Officer
3. Management and Administration		
3.0 Logistics Management (GS)		
Procurement Managers	1101 1102 1103 1150	General Business and Industry Contract and Procurement Industrial Prop. Management Industrial Specialist
Supply Managers	1104 2001 2003 2010 2030 2032 2050	Property Disposal General Supply Supply Program Management Inventory Management District Facility and Storage Management Preservation and Packing Supply Identification Systems

Table B-2 (Continued)

FOG	CSC Series Included	
3. Management and Administration (Continued)		
Transportation Managers	2101	General Transportation
	2111	Transportation Rate and Tariff Examining
	2121	Railroad Safety and Service Inspec- tion
	2125	Highway Safety Management
	2130	Traffic Management
	2131	Freight Rate
	2150	Transportation Operations
	2161	Marine Cargo
Safety Management	018	Safety Management
	019	Safety Technician
Logistics Management	346	Logistics Management
<u>3.1 Personnel Management (GS)</u>		
Personnel Management	142	Manpower Development
	160	Equal Opportunity
	201	Personnel Management
	212	Personnel Staffing
	221	Position Classification
	222	Occupational Analysis
	223	Salary and Wage Administration
	230	Labor-Management Relations
	235	Employee Development
	241	Mediation
	243	Apprenticeship and Training
	244	Labor-Management Relations Examining
	249	Wage and Hour Compliance
Military Personnel Management	205	Military Personnel Management
<u>3.2 Financial Management (GS)</u>		
Financial Management	501	General Accounting (GS-7 and up)
	504	Budget and Accounting
	505	Financial Management
	510	Accounting
	512	Internal Revenue Agent
	541	Fiscal Auditing (GAO)
	560	Budget Administration
	592	Tax Accounting

Table B-2 (Continued)

FOG	CSC Series Included	
3. Management and Administration (Continued)		
3.3 Data Systems Management (GS)		
Computer Specialist	330	Computer Administration
	334	Computer Specialist
Program Analyst	345	Program Analysis
3.4 General Management (GS)		
Security Administration	80	Security Administration
Management Analyst	343	Management Analysis
General Manager and Administrator	301	General Administrative (GS-7 and up)
	340	Program Management
	341	Administrative Officer
	342	Office Services Management
Business Manager and Specialist	1130	Public Utilities Specialist
	1140	Trade Specialist
	1144	Commissary Store Management
	1149	Wage and Hour Law Administrator
	1160	Financial Analysis
	1170	Realty
	1171	Appraising and Assessing
	1173	Housing Management
	1176	Building Management
Facility and Printing Management	1601	General Facilities and Equipment
	1654	Printing Management
	1640	Facility Management
	006	Correctional Institution Administration
	008	Institutional Administration
	009	Institutional Management
	025	Park Management
	027	Crop. Insurance Administration
	028	Environmental Protection Specialist
	105	Social Insurance Administration
	106	Unemployment Insurance
	391	Communications Management
	670	Hospital Administration
	945	Clerk of Court
	1135	Transportation Industry Analysis
	1145	Agriculture Program Specialist
	1146	Agriculture Marketing
	1147	Agriculture Market Reporting
	1165	Loan Specialist
	1630	Cemetery Administration
	1658	Laundry and Dry Cleaning Plant Management



Table B-2 (Continued)

FOG		CSC Series Included
<b>4. Technicians and Subprofessionals</b>		
<b>4.0 Scientific and Engineering Technicians (GS)</b>		
Physical Science Technician	1311	Physical Science Technician
	1316	Hydrologic Technician
	1341	Meteorological Technician
	1361	Navigational Technician
	1371	Cartographic Technician
	1374	Geodetic Technician
Engineering Technician	802	Engineering Technician
Industrial Engineering Technician	895	Industrial Engineering Technician
Engineering Draftsman	818	Engineering Drafting
Surveying Technician	817	Surveying Technician
Electronics Technician	856	Electronics Technician
<b>4.1 Medical Technicians (GS)</b>		
Medical Technician	603	Physician's Assistant
	642	Nuclear Medicine Technician
	645	Medical Technician
	646	Pathology Technician
	647	Radiology Technician
	649	Medical Machine Technician
	650	Medical Technician Assistant
	664	Restoration Technician
	667	Orthotist and Prosthetist
	669	Medical Record Librarian
	672	Prosthetic Representative
	675	Medical Record Technician
	685	Public Health Specialist
	688	Sanitarian
	698	Environmental Health Technician
Dental Technician	681	Dental Assistant
	682	Dental Hygiene
	683	Dental Laboratory Technician
	684	Public Health Dental Hygiene
<b>4.2 Logistics Technicians (GS)</b>		
Quality Assurance	1910	Quality Assurance
	1960	Quality Inspection
	1980	Agriculture Commercial Grading
	1981	Agriculture Commercial Aid
Miscellaneous (not elsewhere classified)	1105	Purchasing (GS-7 and up)
	1152	Production Control
	1670	Equipment Specialist

Table B-2 (Continued)

FOG	CSC Series Included	
4. Technicians and Subprofessionals (Continued)		
	2005	Supply Technician (GS-7 and up)
	2144	Cargo Scheduling
<u>4.3 Management Technicians (GS)</u>		
Accounting Technician	525	Accounting Technician
	526	Tax Technician
	570	Financial Institution Examining
Management Technician	344	Management Technician
Computer Technician	335	Computer Aid and Technician
	362	EAM Project Planning
Computer Operators	332	Computer Operator
Miscellaneous	2132	Travel (GS-7 and up)
(not elsewhere classified)	2133	Passenger Rate (GS-7 and up)
	2135	Transportation Loss and Damage Claims Examining (GS-7 and up)
<u>4.4 Miscellaneous (GS)</u>		
Illustrator	1102	Illustrating
	1021	Office Drafting
	1084	Visual Information
Technical Writer	1083	Technical Writing and Editing
	1412	Technical Information Services
Editors and Writers	1082	Writing and Editing
Photographer	1060	Photography
Information Workers	1001	General Arts and Information
(not elsewhere classified)	1010	Exhibits Specialist
	1016	Museum Specialist
	1045	Translator
	1047	Interpreter
	1048	Foreign Language Broadcasting
	1051	Music Specialist
	1054	Theater Specialist
	1056	Art Specialist
	1071	Audio Visual Production
	1085	Foreign Information
Investigation and Examining	1810	General Investigating
	1811	Criminal Investigating
	1812	Game Law Enforcement
	1815	Air Safety Investigating
	1816	Immigration Inspection
	1822	Coal Mine Inspection

Table B-2 (Continued)

FOG	CSC Series Included	
4. Technicians and Subprofessionals (Continued)		
	1825	Aviation Safety
	1850	Agriculture Commercial Examining
	1854	Alcohol and Tobacco Tax Inspector
	1855	Alcohol Tax Technician
	1860	Public Health Inspection
	1862	Food and Drug Inspection Technician
	1863	Food Inspection
	1864	Public Health Quarantine Inspection
	1889	Import Specialist
	1890	Customs Inspection
	1892	Customs Application and Examining
	1893	Customs Marine Officer
	1894	Customs Entry and Liquidation
	1895	Customs Warehouse Officer
	1898	Admeasurement
	1899	Miscellaneous Inspection
Instructor	1702	Education and Training Technician
	1712	Instruction
	1715	Vocational Rehabilitation
Air Traffic Controller	2152	Air Traffic Controller
Legal Relation Workers	930	Hearing and Appeals
	920	Estate Tax Examining
	950	Paralegal Specialist
	962	Contract Representative
	963	Legal Instruments Examining
	965	Land Law Examining
	967	Passport and Visa Examining
	986	Legal Clerk and Technician
	987	Tax Law Specialist
	990	General Claims Examining
	991	Workmen's Compensation Claims Examining
	992	Loss and Damage Claims Examining
	993	Social Insurance Claims Examining
	994	Unemployment Compensation Claims Examining
	995	Dependent and Estates Claims Examining
	996	Veterans Claims Examining
	997	Civil Service Retirement
	1202	Patent Technician Claims Examining
	1241	Trade-Mark Examining

Table B-2 (Continued)

FOG	CSC Series Included	
4. Technicians and Subprofessionals (Continued)		
Statistical and Mathematics Assistant	1521 1531	Mathematics Technician Statistical Assistant
Communications Specialist	393	Communications Specialist
Communications Equipment Operator	388 389 390 392	Crypto Equipment Operation Radio Operating Communication Relay Operation General Communications
Student Trainees	099 199 499 599 799 899 1399 1599	General Student Trainee Social Science Student Trainee Biological Science Student Trainee Accounting Student Trainee Veterinary Student Trainee Engineering Student Trainee Physical Science Student Trainee Mathematical Student Trainee
Subprofessional (not elsewhere classified)	001 021 023 026 029 030 062 090 102 119 181 186 187 188 189 404 421 455 458 459 462 488 704 809 828 873	Trades, Crafts, and Labor Community Planning Technician Outdoor Recreation Planning Park Technician Environmental Protection Assistant Sports Specialist Clothing Design Guide Social Science Technician Economics Assistant Psychology Aid Technician Social Services Aid and Assistant Social Services Recreation Specialist Recreation Aid and Assistant Biological Technician Plant Pest Control Technician Range Technician Soil Conservation Technician Irrigation System Operation Forestry Technician Fish Hatchery Management Animal Health Technician Construction Control Construction Analyst Ship Surveying

Table B-2 (Continued)

FOG	CSC Series Included	
4. Technicians and Subprofessionals (Continued)		
	1163	Insurance Examining
	1397	Document Analysis
	1411	Library Technician (GS-7 and up)
	1421	Archives Technician
	1541	Cryptoanalysis
	1659	Fishery Methods and Equipment
	2181	Aircraft Operation
5. Clerical		
5.0 Secretarial (GS)		
Typists	316	Clerk-Dictating Machine Transcribing
	322	Clerk-Typist
	324	Cold-Type Composing Machine
	385	Teletypist
Stenographers	312	Clerk-Stenographer and Reporter
	313	Stenographer or Typing Unit Supervising
	319	Closed Microphone Reporting
	318	Secretary
5.1 Financial (GS)		
Accounting Clerks	501	General Accounting Clerical (GS-1--6)
	520	Accounts Maintenance Clerk
Payroll Clerks	530	Cash Processing
	544	Payroll
	545	Military Pay
	590	Time and Leave
Travel Clerks	2132	Travel (GS-1--6)
	2133	Passenger Rate (GS-1--6)
Financial (not elsewhere classified)	540	Voucher Examining
	547	Benefit-Payment Roll
	593	Insurance Accounts
	998	Claims Clerical
	2135	Transportation Loss and Damage Claims Examining (GS-1--6)
5.2 Logistics (GS)		
Shipping Clerks	1106	Procurement Clerical
	2134	Shipment Clerical
Supply Clerks	2005	Supply Clerical (GS-1--6)

Table B-2 (Continued)

FOG	CSC Series Included	
5. Clerical (Continued)		
Logistics (not elsewhere classified)	1105 1107	Purchasing (GS-1--6) Property Disposal Clerical
5.3 General Office Operations (GS)		
Office Machine Operators	350 354 355 356 359	Office Machine Operating Bookkeeping Machine Operation Calculating Machine Operating Data Transcriber EAM Operation
Office Clerical (not elsewhere classified)	203 204 301 304 305 309 351	Personnel Clerical and Assistance Military Personnel Clerical General Clerical (GS-1--6) Information Receptionist Mail and File Correspondence Clerk Printing Clerical
5.4 Miscellaneous (GS)		
	134 302 357 382 394 1046 1087 1411 1897 2151	Intelligence Aid and Clerk Messenger Coding Telephone Operating Communication Clerical Clerks Translator Editorial Assistant Library Assistant (GS-1--6) Customs Aid Dispatching
6. Service		
6.0 Medical (GS)		
Medical Attendants	621 622 625 636 661 699	Nursing Assistant Medical Aid (Sterile Supplies) Autopsy Assistant Rehabilitation Therapy Assistant Pharmacy Assistant Health Aid and Technician
Ward Attendants	75--	Ward Attendants
6.1 Fire and Police (GS)		
Fireman	081 456	Fire Protection and Prevention Forest and Range Fire Control

Table B-2 (Continued)

FOG	CSC Series Included	
6. Service (Continued)		
Guards	007	Correctional Officer
	085	Guard
	1891	Customs Enforcement Officer
Policemen and Detectives	072	Finger Print Identification
	082	United States Marshall
	083	Police
	1896	Border Patrol Agent
6.2 Personnel Services (GS/WB)		
Sales Workers	011	Bond Sales Promotion (GS)
	2091	Sales Store Clerical (WB)
	76--	Mechandising and Personnel Service Workers (WB)
Housekeepers and Stewards	673	Hospital Housekeeping Management (GS)
	1666	General Housekeeping (WB)
	1667	Steward (WB)
Miscellaneous	39--	Motion Picture Workers (WB)
	73--	Laundry and Dry Cleaning Workers (WB)
	74--	Food Service Workers (WB)
7. Craftsmen/Mechanics/Production		
7.0 Electronics Mechanics (WB)		
Inst. Mechanic Electronic	2602	Same
Fire Control Mechanics	2613	Same
Electronics Mechanics	2614	Same
Electronics Mechanics, Ordnance	2645	Same
Electronic Inst. Repairmen	2676	Same
Electronic Mechanics (not elsewhere classified)	26--	Same
7.1 Electricians (WB)		
Electricians	2805	Same
Electrical Line Workers	2806	Same
Power Plant Electricians	2808	Same
Aircraft Electricians	2892	Same
Electricians (not elsewhere classified)	28--	Same

Table B-2 (Continued)

FOG	CSC Series Included	
7. Craftsmen/Mechanics/Production (Continued)		
<u>7.2 Machine Tool Operators (WB)</u>		
Model Makers, Metal	3403	Same
Machinists	3414	Same
Toolmaker	3416	Same
Machine Tool Operators (not elsewhere classified)	34--	Same
<u>7.3 Metal Workers (WB)</u>		
Welders	3703	Same
Blacksmiths	3704	Same
Electroplaters	3711	Same
Molders	3714	Same
Metal Processing Workers (not elsewhere classified)	37--	Same
Coppersmiths	3804	Same
	3853	Same
Sheet Metal Mechanic	3806	Same
Boilermakers	3808	Same
Metal Fabricating Workers	3843	Same
Mobile Equipment Metal Workers	3860	Same
Metal Workers (not elsewhere classified)	38--	Same
Millwrights	5315	Same
<u>7.4 Aircraft Mechanics (WB)</u>		
Fluid Systems Workers	82--	Same
Aircraft Propeller Mechanics	85--	Same
Aircraft and Rocket Engine Mechanics	86--	Same
Aircraft Overhaul Mechanics	88--	Same
<u>7.5 Pipefitting Workers (WB)</u>		
Pipe Coverers	4203	Same
8641 Pipefitters	4204	Same



Table B-2 (Continued)

FOG	CSC Series Included	
7. Craftsmen/Mechanics/Production (Continued)		
8642 Plumbers	4206	Same
8643 Pipefitting Workers (not elsewhere classified)	42—	Same
<u>7.6 Woodworkers (WB)</u>		
8747 Boat Repairmen	4603	Same
8748 Wood Craftsmen	4605	Same
8749 Marine Carpenters	4606	Same
8750 Carpenters	4607	Same
8751 Model Workers, Wood	4614	Same
8752 Patternmakers	4616	Same
8753 Woodmakers (not elsewhere classified)	46—	Same
<u>7.7 Marine Equipment Repairmen (WB)</u>		
8870 Marine Machinist	6203	Same
8871 Shipfitters	6204	Same
8872 Marine Equipment Repairmen (not elsewhere classified)	62—	Same
<u>7.8 Miscellaneous Mechanics/Repairmen (WB)</u>		
Instrument Repairmen	33--	Same
Indoor Equipment Mechanics	48--	Same
Air Conditioning Equipment Mechanic	5306	Same
Aircraft Launching and Arresting Devices Repairmen	5346	Same
Fixed Equipment Repairmen (not elsewhere classified)	53—	Same (except 5315)
Riggers	5722	Same
Automotive Equipment Repairmen	5823	Same
Mobile Equipment Repairmen (not elsewhere classified)	58—	Same (except 5803, 5804)
Railroad Maintenance Workers	61—	Same
Weapons Mechanics and Repairmen	66—	Same

Table B-2 (Continued)

FOG	CSC Series Included	
7. Craftsmen/Mechanics/Production (Continued)		
7.9 Miscellaneous Production Workers (WB)		
Fabric and Leather Workers	31--	Same
Plastics Workers	43--	Same
Printing Workers	44--	Same
Tire and Rubber Workers	45--	Same
Heavy Equipment Operators	5803	Same
	5804	Same
Ammunition and Explosives Workers	65--	Same
Miscellaneous (not elsewhere classified)	27--	Crystal Oscillator Makers
	29--	Test Range Trackers
	32--	Glaziers and Glassblowers
	40--	Optical Instrument Workers
	52--	Miscellaneous Occupations
	54--	Fixed Equipment (except 5407)
	55--	Rock Crushing Plant Operators
	77--	Animal Care Workers
	83--	Transducer Fabricator
	90--	Film Processors
8. Laborers/Operators		
8.0 Vehicle Operators (WB)		
Mobile Equipment Operators (not elsewhere classified)	57--	Same (except 5722)
Ship Operating Workers	59--	Same
Railroad Operating Workers	60--	Same
8.1 Logistics Workers (WB)		
Production Expeditors	67--	Same
Warehouse Workers	69--	Same
Packing and Processing Workers	70--	Same
8.2 Installation Maintenance Workers (WB)		
Telephone Installer and Repairmen	25--	Same
Gardeners and Laborers	35--	Same
Masons, Plasterers, Roofers	36--	Same
Painters	41--	Same

Table B-2 (Continued)

FOG	CSC Series Included	
8. Laborers/Operators (Continued)		
Facilities Maintenance Workers	47—	Same
Power Plant Operators	5407	Same

**APPENDIX C**

**LIFE CYCLE NAVY CIVIL SERVICE BILLET COSTS BY  
FUNCTIONAL OCCUPATIONAL GROUP AND PAY GRADE**

## **LIFE CYCLE NAVY CIVIL SERVICE BILLET COSTS BY FUNCTIONAL OCCUPATIONAL GROUP AND PAY GRADE**

The following information is provided to aid the reader in understanding the cost data contained in this Appendix:

1. "GRD" identifies the pay grades that are included in the table.
2. Initial billet costs represent those administrative expenses associated with creating a new or filling an existing billet (e.g., classification, advertisement, interview, travel, etc.).
3. Yearly (1, 5, 10, 15, and 20) cost figures reflect a 10 percent discount rate. If discounted costs are not desired, use the annually recurring cost column multiplied by the number of years, and then add initial billet costs.
4. The reader will note the rapid drop in billet cost for some high pay grades. This drop, which is due to personnel who remain in Civil Service after they qualify for retirement under maximum annuity conditions, occurs because these personnel are reducing the period of time over which their annuity can be collected (reduced life expectancy). As a result, the government service of these personnel becomes progressively less expensive, a fact which is appropriately portrayed by the tables.
5. Pages C-3 through C-27 contain cost data for General Schedule positions; and pages C-28 through C-93, data for Wage Board positions.

TABLE 2- 100  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
SCIENTISTS  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
5	388	18024	17137	71030	114408	140901	157083
7	473	23032	21900	90783	146241	180124	200827
9	621	28768	27354	113383	182638	224942	250787
11	922	36118	34339	142317	229206	282259	314656
12	1179	43331	41194	170699	274866	338440	377242
13	1385	53918	51260	212412	342043	421162	469455
14	1400	63069	59958	248442	400041	492554	549015
15	1516	67365	64041	265357	427265	526064	586357
16	1806	60240*	57268	237284	382053	470386	524288

\*See paragraph #4, page C-1.

TABLE 2- 110  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
ENGINEERS  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
5	401	21509	20450	84759	136515	168120	187423
6	433	21761	20691	85764	138148	170146	189694
7	484	26417	25117	104095	167651	206458	230157
9	624	30615	29111	120670	194382	239415	266929
11	918	36391	34600	143405	230970	284443	317101
12	1183	43464	41321	171230	275733	339518	378453
13	1366	53614	50971	211215	340116	418789	466811
14	1532	63333	60209	249480	401706	494597	551286
15	1645	66203	62936	260768	419862	516934	576167
16	1965	67427	64099	265578	427594	526439	586750
17	1965	66607 *	63324	262419	422590	520361	580049

\*See paragraph #4, page C-1.

TABLE 2- 200  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MATHEMATICIANS

(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
5	385	18686	17770	73678	118715	146247	163080
7	471	22262	21167	87736	141321	174052	194046
9	614	28462	27064	112195	180745	222632	248231
11	923	35269	33535	139000	223893	275746	307421
12	1176	43029	40909	169539	273034	336218	374796
13	1377	54012	51350	212791	342663	421935	470325
14	1373	62830	59732	247509	398543	490714	546969
15	1486	66890	63588	263467	424200	522267	582105
16	1769	58753*	55853	231415	372589	458719	511272

\*See paragraph #4, page C-1.



TABLE 2- 210  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MEDICAL  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
5	391	17763	16888	69985	112702	138778	154697
6	443	19471	18513	76733	123591	152208	169687
7	482	23805	22633	93805	151084	186061	207423
8	535	28405	27006	111924	180255	221976	247452
9	619	30325	28834	119524	192535	237139	264391
10	681	34948	33228	137723	221824	273185	304555
11	935	35870	34104	141339	227625	280307	312475
12	1205	41763	39704	164519	264912	326180	363574
13	1341	55069	52348	216874	349145	429824	479038
14	1481	64949	61740	255782	411781	506931	564972
15	1689	64641*	61448	254568	409823	504516	562277
18	2020	68810	65413	271015	436332	537184	598713

\*See paragraph #4, page C-1.

TABLE 2- 220  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
LEGAL  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
5	398	19760	18789	77885	125464	154533	172295
6	429	23699	22532	93375	150374	185171	206416
7	476	25591	24331	100835	162395	199981	222932
9	591	29383	27936	115780	186467	229626	255981
11	841	32767	31154	129124	207970	256120	285527
12	1100	38732	36822	152571	245662	302467	337133
13	1378	46899	44583	184708	297370	366092	408016
14	1394	57374	54539	225944	363736	447776	499036
15	1509	66915	63612	263565	424356	522457	582315
16	1797	59886*	56930	235881	379789	467592	521169

\*See paragraph #4, page C-1.

TABLE 2- 230  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
EDUCATORS  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
5	387	17373	16517	68449	110233	135742	151316
7	477	22557	21447	88895	143183	176340	196592
9	613	29546	28092	116428	187518	230929	257440
11	919	35229	33494	138806	223540	275271	306856
12	1178	44959	42745	177143	285277	351293	391599
13	1431	53633	50987	211259	340151	418797	466788
14	1583	62991	59882	248113	399483	491840	548196
15	1567	70230	66764	276621	445375	548333	611153
17	1869	62774*	59670	247177	397880	489770	545805

\*See paragraph #4, page C-1.

TABLE 2- 240  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MISCELLANEOUS PROFESSIONAL  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
5	390	18839	17912	74241	119576	147262	164172
6	445	22200	21108	87486	140911	173538	193466
7	479	23357	22209	92054	148276	182616	203594
8	560	28780	27365	113430	182714	225037	250893
9	614	29806	28340	117460	189188	232994	259749
10	696	38653	36753	152341	245388	302225	336946
11	904	35367*	33626	139355	224429	276371	308086
12	1146	43358	41223	170843	275142	338823	377706
13	1378	52398	49814	206410	332362	409225	456135
14	1523	60657	57664	238919	384679	473612	527878
15	1652	66961	63654	263727	424598	522736	582608

\*See paragraph #4, page C-1.

TABLE 2- 300  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
LOGISTICS MANAGEMENT  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	337	10888	10352	42896	69076	85056	94810
3	337	14897	14164	58701	94538	116419	129780
4	350	17754	16881	69969	112699	138797	154739
5	400	20065	19079	79093	127415	156941	174984
6	459	24158	22970	95211	153363	188884	210583
7	490	26025	24748	102596	165287	203598	227014
8	554	31541	29990	124311	200238	246618	274951
9	635	31624	30070	124654	200813	247348	275784
10	705	37741	35884	148732	239557	295027	328907
11	909	37639*	35788	148346	238955	294305	328119
12	1163	44320	42138	174633	281246	346338	386084
13	1385	52819	50214	208066	335025	412500	459783
14	1524	61907	58852	243841	392602	483364	538746
15	1653	67351	64026	265273	427099	525826	586064
16	1975	66991*	63684	263853	424809	523003	582913

\*See paragraph #4, page C-1.

TABLE 2- 310  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
PERSONNEL MANAGEMENT  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
4	345	15945	15160	62829	101187	124608	138909
5	390	20723	19706	81704	131643	162169	180831
6	435	21834	20760	86050	138604	170704	190312
7	478	23559	22402	92864	149596	184259	205439
8	537	26819	25500	105702	170266	209708	233804
9	631	29579	28125	116583	187795	231298	257875
10	700	35191	33460	138684	223376	275100	306693
11	912	37184	35356	146564	236101	290804	324229
12	1157	43832	41674	172721	278182	342581	381910
13	1395	53042	50427	208956	336470	414293	461792
14	1542	61475	58442	242153	389898	480050	535063
15	1672	67972	64618	267738	431086	530753	591571

TABLE 2- 320  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
FINANCIAL MANAGEMENT  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
3	336	15266	14514	60153	96878	119302	132996
4	347	17033	16194	67115	108091	133110	148387
5	395	19182	18239	75600	121773	149978	167207
6	454	26100	24816	102854	165663	204021	227450
7	483	24750*	23532	97534	157091	193464	215678
8	540	30629	29123	120717	194447	239485	266998
9	627	30398*	28904	119814	193006	237722	265044
10	694	35643	33889	140463	226239	278624	310620
11	903	36825	35014	145135	233779	287924	321002
12	1168	43167	41041	170082	273910	337297	375999
13	1371	52305	49725	206044	331774	408503	455332
14	1607	62295	59222	245383	395099	486453	542201
15	1744	66491	63209	261888	421647	519112	578578
16	2088	71541	68011	281798	453730	558639	622658

\*See paragraph #4, page C-1.

TABLE 2- 330  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
DATA SYSTEMS MANAGEMENT  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	334	11457	10893	45147	72714	89549	99831
3	334	13468	12805	53075	85483	105275	117363
4	345	23807	22653	94046	151743	187143	208867
5	390	19582*	18620	77191	124354	153174	170787
6	453	23217	22076	91517	147428	181589	202464
7	472	23519	22363	92698	149322	183914	205049
8	525	30327	28837	119543	192581	237208	264480
9	627	28668*	27258	112981	181980	224122	249863
10	696	33453	31805	131809	212270	261391	291382
11	903	36749	34942	144840	233311	287355	320373
12	1109	43321	41188	170697	274908	338537	377389
13	1351	52286	49708	205971	331658	408360	455174
14	1492	62329	59253	245510	395298	486693	542463
15	1617	65253	62032	257012	413796	509448	567808

\*See paragraph #4, page C-1.



TABLE 2- 340  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
CENTRAL MANAGEMENT  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
4	350	17630	16762	69467	111876	137769	153580
5	400	20082	19094	79137	127459	156967	174988
6	452	24761	23543	97583	157179	193581	215816
7	490	26051	24771	102683	165410	203733	227149
8	551	30085	28606	118577	191006	235253	262285
9	633	31659	30103	124784	201009	247575	276026
10	706	37259	35426	146842	236528	291310	324776
11	918	37410	35570	147435	237478	292474	326069
12	1180	44475	42284	175231	282195	347493	387359
13	1403	53593	50949	211112	339925	418530	466501
14	1419	63107	59992	248565	400207	492727	549181
15	1536	68516	65134	269869	434504	534949	596236
16	1831	61239 *	58210	241129	388144	477783	532444

\*See paragraph #4, page C-1.

TABLE 2- 400  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
SCIENTIFIC AND ENGINEERING TECHNICIANS  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	337	11065	10520	43595	70207	86453	96372
2	337	13559	12894	53455	86122	106087	118290
3	337	15108	14367	59565	95971	118225	131830
4	350	17556	16696	69228	111552	137430	153255
5	400	20345	19347	80221	129260	159242	177574
6	444	23023	21894	90772	146252	180166	200898
7	501	25961	24687	102352	164909	203147	226523
8	544	28641	27234	112906	181898	224061	249830
9	654	33469	31827	131958	212611	261912	292052
10	728	36223	34445	142804	230074	283412	316014
11	953	39796	37842	156877	252732	311308	347106
12	1207	46855	44550	184650	297413	366281	408346
13	1513	56641	53850	223154	359358	442500	493256
14	1676	65035	61830	256226	412615	508078	566355
15	1821	75336	71616	296706	477682	588077	655424

TABLE 2- 410  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MEDICAL TECHNICIANS  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
2	336	12238	11635	48216	77643	95606	106571
3	336	15374	14617	60581	97570	120157	133950
4	348	17526	16663	69058	111220	136964	152685
5	396	19701	18731	77631	125030	153973	171648
6	441	22492	21385	88628	142738	175778	195953
7	486	24902	23676	98121	158026	194602	216937
8	551	27922	26547	110022	177192	218204	243248
9	633	30911	29389	121802	196166	241571	269298
10	646	37245	35412	146770	236389	291117	324541
11	737	37491	35647	147755	237998	293119	326792
12	828	37912	36037	149283	240302	295802	329646

TABLE 2- 420  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
LOGISTICS TECHNICIANS  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
3	339	16698	15875	65794	105963	130489	145466
4	352	17279	16428	68088	109663	135051	150556
5	404	20178	19185	79518	128077	157733	175847
6	453	22904	21777	90253	145358	179006	199554
7	499	27078	25747	106729	171925	211755	236090
8	547	30298	28808	119407	192337	236885	264098
9	642	33056	31431	130282	209857	258466	288162
10	712	36690	34885	144598	232909	286849	319798
11	930	38507	36613	151761	244450	301067	335653
12	1258	45144	42920	177871	286451	352739	393212
13	1502	54646	51950	215263	346615	426773	475693
14	1664	68758	65364	270826	436051	536860	598372
15	1808	74671	70986	294111	473531	582995	649784

TABLE 2- 430  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MANAGEMENT TECHNICIANS  
(GS)

GPD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	338	11030	10486	43457	69984	86178	96065
2	338	12268	11664	48334	77834	95841	106834
3	338	14886	14153	58665	94495	116380	129748
4	350	17437	16579	68713	110671	136294	151942
5	401	20073	19085	79102	127404	156901	174916
6	449	22950	21820	90433	145645	179356	199942
7	491	26207	24919	103299	166403	204957	228515
8	536	29604	28149	116681	187951	231487	258085
9	635	31886	30318	125675	202441	249338	277989
10	716	35120	33394	138423	222977	274631	306190
11	923	37680	35827	148497	239186	294576	328410
12	1053	45543	43299	179440	288974	355844	396670
13	1169	53995	51331	212694	342473	421666	469996

TABLE 2- 440  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MISCELLANEOUS TECHNICIANS  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	336	11081	10535	43660	70311	86580	96513
2	336	13354	12699	52653	84841	104521	116553
3	336	13742	13065	54149	87211	107399	119727
4	348	16153	15358	63660	102540	126288	140795
5	396	19144	18202	75442	121513	149650	166837
6	449	23639	22477	93172	150085	184852	206093
7	492	25120	23884	98994	159445	196364	218914
8	539	29538	28086	116422	187536	230978	257519
9	640	31894	30326	125708	202496	249407	278069
10	726	35573	33824	140201	225832	278138	310091
11	940	38273	36392	150852	243000	299293	333687
12	1177	46695	44400	184051	296483	365173	407142
13	1442	55444	52716	218496	351923	433410	483181
14	1596	62909	59809	247853	399139	491490	547870
15	1732	70933	67444	279550	450277	554554	618251

TABLE 2- 500  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
SECRETARIAL  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	338	11146	10597	43919	70731	87102	97098
2	338	12477	11863	49161	79171	97491	108677
3	338	14977	14240	59024	95072	117089	130538
4	351	17541	16678	69126	111338	137117	152861
5	403	20380	19377	80311	129351	159300	177591
6	449	22912	21784	90282	145402	179059	199611
7	498	26714	25401	105292	169609	208900	232905
8	534	29466	28017	116133	187064	230390	256858
9	643	32959	31338	129895	209231	257691	287294
10	653	34792	33080	137110	220841	271978	303213
11	746	38624	36723	152203	245140	301893	336554

TABLE 2- 510  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
FINANCIAL CLERKS  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	339	11253	10699	44338	71406	87931	98022
2	339	13467	12805	53075	85492	105293	117389
3	339	15052	14312	59323	95557	117691	131213
4	353	17786	16910	70088	112887	139024	154987
5	405	20579	19566	81096	130615	160856	179325
6	453	24290	23096	95736	154214	189937	211761
7	494	27415	26068	108060	174074	214406	239050
8	533	30277	28788	119329	192213	236733	263930
9	649	32270	30684	127193	204889	252356	281357
10	707	34618	32915	136432	219754	270647	301734
11	976	39262	37331	154731	249225	306939	342191
12	1117	44626	42427	175823	283147	348664	388664
13	1244	58619	55725	230887	371744	457683	510121



TABLE 2- 520  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
LOGISTICS CLERKS  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	339	11600	11028	45703	73602	90634	101033
2	339	13768	13090	54255	87385	107617	119974
3	339	15154	14408	59720	96190	118464	132069
4	352	18169	17275	71596	115312	142006	158309
5	404	21296	20249	83924	135171	166468	185583
6	458	24979	23751	98459	158609	195360	217816
7	493	27110	25778	106866	172162	212062	236446
8	577	31262	29725	123211	198468	244440	272525
9	693	32072	30495	126406	203615	250779	279593
10	586	41132	39108	162092	261072	321519	358438
11	662	44159	41984	173994	280215	345068	384667
12	737	31370*	29826	123614	199090	245179	273325

\*See paragraph #4, page C-1.

TABLE 2- 530  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
GENERAL OFFICE OPERATIONS  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	339	11187	10636	44080	70990	87420	97452
2	339	12786	12156	50376	81124	99894	111352
3	339	15377	14621	60599	97605	120205	134009
4	352	18095	17204	71302	114836	141420	157654
5	404	20840	19815	82125	132271	162894	181596
6	454	23956	22778	94420	152096	187331	208859
7	505	27026	25698	106525	171598	211353	235642
8	601	30547	29046	120402	193951	238886	266340
9	656	34091	32416	134372	216457	266605	297246
10	666	44678	42478	176047	283529	349157	389233
11	763	40099*	38126	158022	254520	313453	349449

\*See paragraph #4, page C-1.

TABLE 2- 540  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR  
MISCELLANEOUS CLERICAL  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	338	13432	12777	53007	85464	105340	117514
2	338	14067	13376	55445	89313	110004	122645
3	338	16117	15324	63518	102313	126010	140487
4	351	18658	17740	73529	118433	145858	162610
5	403	21221	20177	83634	134711	165908	184965
6	445	24336	23141	95929	154538	190350	212234
7	487	26749	25435	105439	169859	209222	233276
8	531	28733	27321	113251	182433	224699	250523
9	653	31203	29669	122988	198120	244021	272068
10	711	34355	32666	135400	218100	268617	299477
11	820	39743	37788	156627	252279	310700	346385
12	928	45040	42821	177454	285769	351889	392255

TABLE 2- 600  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MEDICAL ATTENDANTS  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
2	334	14434	13724	56886	91631	112854	125819
3	334	15645	14876	61662	99325	122332	136387
4	345	18372	17468	72400	116611	143612	160104
5	390	20639	19623	81335	131005	161341	179870
6	434	23200	22059	91430	147267	181370	202202
7	477	23544	22386	92791	149464	184081	205228
8	498	26506	25202	104455	168240	207194	230986
9	595	29513	28061	116310	187344	230730	257232
11	732	33154	31522	130639	210397	259095	288832
12	822	37426	35577	147383	237261	292075	325507

TABLE 2- 610  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
FIRE AND POLICE  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
2	340	13389	12733	52797	85077	104815	116885
3	340	16148	15357	63689	102644	126472	141050
4	353	18774	17854	74026	119277	146941	163856
5	406	21429	20378	84489	136131	167699	186998
6	454	25115	23884	99036	159587	196611	219252
7	495	27649	26293	109024	175676	216429	241349
8	541	30506	29010	120290	193830	238794	266289
9	648	32432	30841	127874	206035	253815	283027
10	710	35880	34119	141456	227906	280745	313043
11	883	39110	37191	154192	248427	306026	341234
12	1004	44883	42678	176923	285019	351070	391433
13	1114	50527	48037	199073	320590	394772	440061

TABLE 2- 620  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
PERSONNEL SERVICES  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	336	11310	10754	44573	71795	88421	98578
2	336	12841	12209	50601	81498	100365	111888
3	336	15208	14461	59942	96558	118926	132593
4	348	18439	17532	72665	117040	144141	160695
5	396	20926	19896	82467	132828	163586	182373
6	443	22047	20964	86904	140000	172443	192268
7	501	24970	23745	98444	158608	195380	217858
8	526	28261	26872	111394	179448	221027	246434
9	606	33486	31841	131996	212637	261909	292017
10	632	33562	31912	132276	213071	262425	292577
11	719	34430	32737	135698	218582	269212	300143
12	807	36346	34550	143133	230422	283659	316131

TABLE 2- 631  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
PERSONNEL SERVICES--GENERAL LABOR  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	317	17868	16991	70445	113496	139810	155894
2	317	20201	19210	79652	128344	158113	176315
3	317	20564	19555	81075	130629	160919	179436
4	317	21672	20606	85413	137580	169445	188911
5	317	24225	23036	95505	153870	189542	211346
6	317	25435	24189	100303	161633	199136	222072
7	317	28681	27278	113132	182339	224680	250587
8	317	30072	28600	118603	191141	235510	262652
9	317	29061*	27639	114621	184729	227615	253852

\*See paragraph #4, page C-1.

TABLE 2- 632  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
PERSONNEL SERVICES--WAGE LEADER  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	312	28401	27002	111903	180212	221913	247374
2	312	26099*	24814	102834	165609	203934	227333
3	312	27079*	25745	106698	171836	211606	235890
4	312	29753	28287	117224	188775	232452	259116
5	312	34558	32862	136243	219508	270401	301511
6	312	34000*	32335	134084	216077	266220	296889
7	312	37658	35815	148528	239374	294946	328944
8	312	41041	39031	161866	260866	321424	358470
9	312	35479*	33749	140015	225748	278249	310404
10	312	41728	39688	164612	265332	326966	364686
11	312	41114*	39101	162145	261302	321946	359040
12	312	41664*	39619	164261	264652	326015	363526

\*See paragraph #4, page C-1.



TABLE 2- 633  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
PERSONNEL SERVICES--NON-SUPERVISORY/SCHEDULING  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	344	20195	19199	79562	128122	157762	175857
2	344	21680	20613	85433	137599	169454	188909
3	344	19968*	18986	78693	126748	156097	174023
4	359	24546	23342	96777	155926	192082	214185
5	417	28800	27389	113568	183002	225457	251419
7	494	30517	29022	120345	193934	238936	266460
8	517	32293	30711	127342	205199	252805	281918

\*See paragraph #4, page C-1.

TABLE 2- 700  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
ELECTRONICS MECHANICS--APPRENTICE  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	321	19694	18725	77606	124992	153927	171599
2	321	22038	20956	86876	139961	172402	192228
3	321	20099*	19112	79228	127635	157214	175289
4	321	24002	22823	94611	152416	187736	209320
5	321	23565*	22407	92886	149632	184304	205491
6	321	25271	24028	99599	160435	197597	220301
7	321	26255	24964	103472	166666	205264	228841
8	321	25473*	24220	100389	161700	199148	222024
11	321	23233*	22089	91542	147427	181547	202380

\*See paragraph #4, page C-1.

TABLE 2- 701  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
ELECTRONICS MECHANICS--GENERAL LABOR  
(GS)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
2	321	17877	17003	70523	113675	140082	156244
3	321	22073	20988	87008	140168	172650	192501
5	321	25595	24341	100936	162657	200402	223488
6	321	28081	26703	110712	178376	219735	245018
7	321	31897	30337	125816	202781	249867	278677
8	321	29751*	28296	117349	189131	233044	259912
9	321	29607*	28156	116760	188160	231827	258536
10	321	31630*	30082	124750	201048	247718	276267
11	321	33866	32206	133548	215205	265139	295678
12	321	36180	34409	142701	229986	283382	316049
13	321	37579	35739	148207	238844	294280	328189
14	321	36735*	34931	144809	233287	287353	320394
15	321	32727*	31117	128974	207738	255844	285227

\*See paragraph #4, page C-1.

TABLE 2- 702  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
ELECTRONICS MECHANICS--WAGE LEADER  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
7	318	34892	33186	137653	221888	273441	304995
8	318	43590	41472	172133	277659	342360	382035
9	318	41223*	39209	162647	262198	323137	360444
10	318	42710*	40624	168510	271644	334773	373419
11	318	43825	41679	172842	278549	343204	382755
12	318	44544	42360	175642	283019	348669	388812
13	318	42871*	40759	168913	272022	334967	373398
14	318	44188*	42011	174107	280392	345282	384902
15	318	46701	44399	183991	296291	364840	406687
16	318	46507*	44216	183236	295086	363367	405054
17	318	57661	54816	227128	365708	450268	501870

\*See paragraph #4, page C-1.

TABLE 2- 703  
 PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
 ELECTRONICS MECHANICS--NON-SUPERVISORY/SCHEDULING  
 (WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
10	318	31485	29935	124060	199800	246044	274282
11	318	34181	32498	134691	216932	267151	297820
12	318	35181	33453	138677	223404	275175	306811
13	318	36540	34739	143963	231838	285481	318231

TABLE 2- 704  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
ELECTRONICS MECHANICS--SUPERVISORY  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
3	362	21301	29760	123345	198662	244657	272747
5	465	37818	35967	149166	240410	296229	330381
6	501	39302	37375	154971	249710	307634	343053
7	539	42909	40810	169254	272796	336144	374906
8	567	39754*	37800	156686	252393	310859	346578

\*See paragraph #4, page C-1.

TABLE 2- 710  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
ELECTRICIANS--APPRENTICE  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	321	18603	17688	73313	118083	145427	162128
2	321	20699	19683	81603	131475	161958	180591
3	321	19367*	18416	76348	123000	151509	168933
4	321	21584	20525	85095	137100	168886	188316
5	321	22522	21416	88782	143029	176177	196434
6	321	23657	22494	93247	150211	185015	206281
7	321	25158	23921	99155	159717	196712	219312
8	321	25511	24256	100538	161940	199443	222352
10	321	22785*	21663	89778	144587	178051	198485

\*See paragraph #4, page C-1.

TABLE 2- 711  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
ELECTRICIANS--GENERAL LABOR  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	321	16395	15591	64646	104165	128325	143097
2	321	16647	15832	65661	105826	130398	145432
3	321	23333	22187	91969	148150	182474	203445
4	321	20635*	19622	81350	131065	161451	180024
5	321	24044	22866	94823	152810	188274	209966
6	321	27193	25860	107219	172758	212823	237318
7	321	29603	28153	116755	188165	231847	258569
8	321	28897*	27485	114005	183770	226468	252603
9	321	29427*	27987	116074	187084	230529	257113
10	321	32260	30681	127231	205043	252636	281749
11	321	34366	32684	135542	218440	269146	300165
12	321	33905*	32244	133710	215474	265479	296065
13	321	37599	35759	148302	239017	294512	328466
15	321	33496*	31846	131979	212546	261734	291767

\*See paragraph #4, page C-1.



TABLE 2- 712  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
ELECTRICIANS--WAGE LEADER  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
7	319	39297	37375	155009	249839	307858	343361
8	319	40680	38690	160465	258632	318693	355445
9	319	43023	40922	169751	273650	337251	376189
10	319	43692	41558	172383	277885	342461	381992
11	319	45700	43462	180239	290470	357893	399138
12	319	45229 *	43013	178353	287398	354075	394850
13	319	42580 *	40483	167774	270193	332723	370903
14	319	44277 *	42095	174443	280918	345913	385592
15	319	45399 *	43162	178871	288057	354711	395406
16	319	51109	48591	201359	324258	399277	445072

\*See paragraph #4, page C-1.

TABLE 2- 713  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
ELECTRICIANS--NON-SUPERVISORY/SCHEDILING  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
8	319	29240	27807	115306	185808	228919	255285
9	319	34460	32762	135774	218656	269255	300149
10	319	32466*	30869	127945	206079	253798	282945
11	319	26777*	25458	105495	169881	209182	233173
13	319	37485	35640	147718	237920	293007	326651

\*See paragraph #4, page C-1.

TABLE 2- 714  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
ELECTRICIANS--SUPERVISORY  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
4	394	31238	29700	123092	198248	244141	272167
5	489	39281	37357	154919	249661	307608	343054
6	499	38748*	36849	152793	246208	303326	338255
7	537	49097	46694	193654	312113	384583	428923
8	563	39519*	37576	155761	250907	309032	344544
10	657	39095*	37188	154288	248764	306622	342059

\*See paragraph #4, page C-1.

TABLE 2- 720  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MACHINE TOOL OPERATORS--APPRENTICE  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	321	19826	18850	78126	125828	154957	172746
2	321	21551	20493	84960	136877	168606	187999
3	321	20375*	19374	80314	129383	159365	177686
4	321	22515	21410	88760	142999	176146	196406
5	321	23493	22339	92604	149180	183747	204870
6	321	24200	23010	95384	153650	189247	210997
7	321	25953	24676	102283	164751	202907	226216
8	321	25250*	24008	99513	160290	197412	220089
10	321	22715*	21596	89503	144144	177506	197878
13	321	23756*	22586	93603	150743	185628	206927

\*See paragraph #4, page C-1.

TABLE 2- 721  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MACHINE TOOL OPERATORS--GENERAL LABOR  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	321	19142	18202	75455	121556	149726	166940
2	321	16798*	15976	66256	106783	131575	146743
3	321	21451	20397	84560	136230	167805	187103
5	321	25692	24433	101316	163266	201149	224317
6	321	28185	26804	111151	179119	220686	246109
8	321	29249	27817	115356	185909	229064	255464
9	321	30591	29092	120635	194398	239506	267093
10	321	33036	31417	130281	209949	258671	288471
11	321	34767	33065	137119	220979	272271	303647
12	321	36330	34550	143276	230894	284482	317260
13	321	36578	34786	144245	232443	286377	319362
14	321	37456	35617	147655	237878	293012	326707
15	321	36783*	34970	144921	233379	287379	320346

\*See paragraph #4, page C-1.

TABLE 2- 722  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MACHINE TOOL OPERATORS--WAGE LEADER  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
7	319	32651	31054	128795	207589	255798	285298
9	319	44201	42042	174393	281129	346463	386459
10	319	44638	42457	176116	283902	349876	390263
11	319	43786*	41642	172689	278304	342904	382422
12	319	44801	42604	176652	284644	350669	391040
13	319	43538*	41393	171542	276258	340187	379219
14	319	43107*	40984	169841	273511	336798	375435
15	319	46305	44023	182433	293782	361751	403245
16	319	47796	45441	188315	303265	373439	416283
17	319	43976*	41808	173245	278975	343507	382898

\*See paragraph #4, page C-1.

TABLE 2- 723  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MACHINE TOOL OPERATORS--NON-SUPERVISORY/SCHEDULING  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
8	319	39094	37176	154136	248350	305942	341152
9	319	32909*	31290	129684	208872	257230	286765
10	319	33731*	32071	132918	214073	263629	293891
11	319	30548*	29041	120337	193768	238580	265931
13	319	30419*	28922	119868	193058	237751	265046
14	319	41046	39025	161731	260466	320747	357555

\*See paragraph #4, page C-1.

TABLE 2- 724  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MACHINE TOOL OPERATORS--SUPERVISORY  
(WB)

CRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
4	391	32394	30799	127646	205582	253170	282232
5	483	37892	36038	149458	240880	296808	331026
6	508	38784	36883	152936	246438	303610	338571
7	562	47608	45276	187760	302588	372821	415784
8	594	41152*	39128	162186	261242	321747	358768
9	665	43649*	41512	172152	277441	341844	381242
13	960	41014*	39011	161821	260863	321488	358602

\*See paragraph #4, page C-1.



TABLE 2- 730  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
METAL WORKERS--APPRENTICE  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	321	19056	18118	75094	120949	148953	166057
2	321	20801	19780	82006	132123	162755	181479
3	321	19822*	18849	78139	125882	155056	172886
4	321	21827	20756	86053	138642	170784	190431
5	321	22332	21235	88031	141820	174689	194777
6	321	23769	22601	93688	150922	185890	207255
7	321	25357	24110	99937	160975	198260	221037
8	321	24960*	23733	98373	158455	195155	217574
9	321	24136*	22947	95096	153146	188585	210223
10	321	21575*	20513	85016	136923	168619	187975

\*See paragraph #4, page C-1.

TABLE 2- 731  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
METAL WORKERS--GENERAL LABOR  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	321	19125	18185	75387	121446	149590	166788
2	321	16671*	15855	65755	105977	130584	145639
3	321	21179	20139	83492	134510	165689	184745
4	321	22967	21839	90532	145843	179638	200290
5	321	23846	22679	94056	151586	186780	208311
6	321	22169*	21082	87413	140850	173520	193497
7	321	28569	27171	112681	181601	223761	249553
8	321	28199*	26819	111224	179257	220876	246338
9	321	32148	30575	126801	204363	251812	280843
10	321	32573	30977	128458	207013	255057	284443
11	321	34653	32957	136679	220282	271425	302716
12	321	36266	34492	143050	230558	284095	316853
13	321	36718	34921	144824	233408	287598	320752
15	321	31029*	29501	122265	196913	242492	270325

\*See paragraph #4, page C-1.

TABLE 2- 732  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
METAL WORKERS--WAGE LEADER  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
6	320	38655	36760	152424	245610	302587	337428
7	320	40397	38421	159356	256855	316514	353024
8	320	42499	40420	167633	270176	332910	371294
9	320	43801	41662	172819	278592	343337	382973
10	320	43699*	41564	172413	277939	342534	382078
11	320	45644	43410	180036	290166	357541	398765
12	320	44400*	42223	175072	282099	347535	387548
13	320	42560*	40464	167696	270073	332580	370747
14	320	44263*	42082	174390	280831	345805	385470
15	320	45518*	43276	179346	288825	355663	396471

\*See paragraph #4, page C-1.

TABLE 2- 733  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
METAL WORKERS---NON-SUPERVISORY/SCHEDULING  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
7	320	30565	29069	120553	194291	239399	266996
8	320	27029*	25708	106630	171879	211811	236252
9	320	32779	31164	129155	208002	256142	285535
10	320	31326*	29784	123443	198816	244842	272951
11	320	33217	31584	130916	210876	259717	289555
12	320	34754	33042	136932	220520	271550	302705
13	320	31505*	29954	124144	199940	246221	274484

\*See paragraph #4, page C-1.

TABLE 2- 734  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
METAL WORKERS--SUPERVISORY  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
4	404	32696	31089	128864	207572	255650	285021
5	508	39543	37611	156016	251506	309958	345741
6	500	38952*	37043	153600	247513	304939	340057
7	539	54004	51355	212935	343102	422681	471338
8	621	39732*	37779	156605	252273	310720	346432
10	736	47778*	45441	188463	303759	374301	417467

\*See paragraph #4, page C-1.

TABLE 2- 740  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
AIRCRAFT MECHANICS--APPRENTICE  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	320	23449	22296	92413	148350	183320	204375
2	320	22451*	21349	88502	142578	175623	195817
3	320	20320*	19322	80100	129038	158940	177213
4	320	21957*	20879	86563	139463	171795	191558
5	320	20680*	19665	81531	131358	161813	180430
6	320	23337	22190	91987	148183	182519	203499
7	320	23049*	21916	90851	146353	180264	200985
8	320	24198	23008	95370	153623	189207	210946
10	320	22751*	21631	89646	144375	177791	198195

\*See paragraph #4, page C-1.

TABLE 2- 741  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
AIRCRAFT MECHANICS--GENERAL LABOR  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
2	320	19306	18361	76150	122730	151227	168663
3	320	24644	23435	97158	156536	192829	215013
5	320	24158*	22975	95282	153560	189210	211020
7	320	27838	26476	109813	177000	218111	243270
8	320	28903	27488	113994	183714	226359	252446
9	320	31925	30360	125893	202866	249934	278718
10	320	34437	32752	135836	218930	269767	300873
11	320	34982	33268	137960	222326	273924	305485
12	320	34994	33281	138025	222450	274095	305692
13	320	42418	40338	167252	269492	331997	370214

\*See paragraph #4, page C-1.

TABLE 2- 742  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
AIRCRAFT MECHANICS--WAGE LEADER  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
6	319	39665	37720	156404	252022	310485	346234
7	319	44431	42267	175392	282846	348686	389033
8	319	41524*	39494	163805	264029	325357	362889
9	319	41235*	39222	162706	262302	323275	360606
10	319	43490*	41366	171588	276603	340882	380232
11	319	44979	42775	177370	285820	352137	392695
12	319	44179*	42012	174196	280681	345782	385587
13	319	39336*	37399	154998	249627	307407	342689
14	319	45525	43281	179357	288826	355646	396436

\*See paragraph #4, page C-1.



TABLE 2- 743  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
AIRCRAFT MECHANICS--NON-SUPERVISORY/SCHEDULING  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
5	319	25832	24569	101900	164243	202389	225732
7	319	30282	28798	119408	192409	237044	264338
8	319	32344	30760	127564	205581	253301	282492
9	319	36092*	28611	118576	190971	235177	262171
10	319	31607*	30053	124572	200658	247134	275526
11	319	31775*	30210	125203	201640	248309	276806

\*See paragraph #4, page C-1.

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TABLE 2- 744  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
AIRCRAFT MECHANICS--SUPERVISORY  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
4	389	34177	32491	134626	216765	266884	297469
5	477	35892	34136	141576	228183	281170	313591
6	505	39150	37230	154376	248757	306465	341754
7	544	46185	43924	182159	293574	361726	403420
8	574	40659*	38659	160239	258104	317880	354395

\*See paragraph #4, page C-1.

TABLE 2- 750  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
PIPEFITTING WORKERS--APPRENTICE  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	320	18695	17775	73673	118663	146140	162923
2	320	20651	19637	81416	131173	161586	180176
3	320	19019*	18083	74951	120724	148680	165756
4	320	21517	20461	84831	136676	168365	187736
5	320	23017	21886	90729	146162	180033	200732
6	320	23478	22324	92542	149076	183618	204724
7	320	24969	23741	98410	158518	195236	217668
8	320	26137	24851	103004	165908	204327	227794
10	320	22214*	21120	87531	140972	173602	193527

\*See paragraph #4, page C-1.

TABLE 2- 751  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
PIPEFITTING WORKERS--GENERAL LABOR  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	320	17148	16307	67610	108933	134192	149634
2	320	17335	16488	68391	110244	135859	151539
3	320	21652	20589	85353	137505	169374	188851
5	320	24624	23418	97113	156502	192827	215046
7	320	42363	40325	167551	270573	333925	372888
8	320	27767*	26409	109532	176542	217542	242630
9	320	30915*	29400	121908	196445	242024	269897
10	320	32225*	30648	127097	204830	252377	281464
11	320	34881*	33174	137571	221709	273173	304656
12	320	36344*	34566	143361	231066	284726	317562
13	320	36328*	34549	143272	230890	284478	317257
14	320	33720*	32064	132930	214159	263799	294139
15	320	33668*	32010	132655	213636	263075	293262

\*See paragraph #4, page C-1.

TABLE 2- 752  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
PIPEFITTING WORKERS--WAGE LEADER  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
7	320	33610	31965	132569	213662	263272	293626
8	320	34282	32608	135272	218077	268773	299813
9	320	42661	40577	168318	271338	334398	373003
10	320	43412	41292	171285	276120	340291	379577
11	320	38060*	36195	150092	241871	297998	332326
12	320	42736*	40641	168516	271539	334530	373048
13	320	42087*	40014	165827	267059	328862	366598
14	320	44200	42022	174148	280451	345347	384969
15	320	44044*	41877	173565	279549	344271	383800
16	320	47967	45602	188960	304268	374639	417589

\*See paragraph #4, page C-1.

TABLE 2- 753  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
PIPEFITTING WORKERS--NON-SUPERVISORY/SCHEDULING  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
9	320	23684	22520	93345	150357	185183	206458
10	320	32757	31144	129075	207880	255999	285383
12	320	31582*	30027	124442	200414	246800	275124
13	320	36926	35106	145484	234286	288494	321589

\*See paragraph #4, page C-1.

TABLE 2- 754  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
PIPEFITTING WORKERS--SUPERVISORY  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
4	404	31060	29528	122353	197013	242575	270382
5	508	39221	37301	154694	249311	307190	342599
6	499	37249*	35424	146891	236708	291632	325223
7	536	54028	51395	213241	343839	423832	472834
8	625	39360*	37426	155140	249912	307812	343189
10	741	48343*	45978	190690	307344	378715	422386

\*See paragraph #4, page C-1.



TABLE 2- 760  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
WOOD WORKERS--APPRENTICE  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	320	19277	18329	75966	122352	150680	167980
2	320	19135*	18197	75449	121570	149767	167007
3	320	19869	18893	78323	126179	155422	173293
4	320	20669	19655	81491	131300	161748	180362
5	320	22083	20998	87051	140243	172748	192614
6	320	22964	21836	90520	145823	179614	200263
7	320	24541	23335	96726	155809	191901	213952
8	320	26267	24974	103514	166729	205338	228921
10	320	21565*	20503	84975	136857	168538	187884

\*See paragraph #4, page C-1.

TABLE 2- 761  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
WOOD WORKERS--GENERAL LABOR  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
2	320	18728	17812	73873	119066	146717	163638
3	320	20054	19070	79065	127388	156925	174981
4	320	21617	20555	85216	137287	169108	188556
5	320	24507	23307	96652	155759	191910	214022
7	320	35053	33352	138449	223356	275434	307380
8	320	31843*	30285	125601	202434	249439	278200
9	320	30456*	28964	120104	193543	238453	265919
10	320	32008*	30441	126236	203437	250656	279540
11	320	36355	34573	143364	231022	284626	317410
12	320	33810*	32155	133354	214923	264822	295351
14	320	35673*	33921	140622	226542	279043	311127

\*See paragraph #4, page C-1.

TABLE 2- 762  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
WOOD WORKERS--WAGE LEADER  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
4	318	30149	28665	118800	191332	235621	262666
6	318	39540	37602	155926	251270	309576	345236
7	318	40872	38874	161246	259921	320311	357276
8	318	42257	40190	166681	268645	331027	369197
9	318	42984	40885	169599	273406	336950	375853
10	318	43290	41175	170793	275320	339297	378461
11	318	47700	45362	188093	303089	373403	416400
12	318	49005	46600	193200	311271	383436	427548
13	318	45522*	43279	179351	288824	355651	396449
14	318	42879*	40766	168937	272054	335001	373429

\*See paragraph #4, page C-1.

TABLE 2- 763  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
WOOD WORKERS--NON-SUPERVISORY/SCHEDULING  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
5	318	31623	30071	124667	200850	247410	275869
6	318	29964*	28497	118178	190455	234665	261709
8	318	34374	32690	135557	218448	269139	300143
9	318	29398*	27952	115857	186610	229823	256218
10	318	30104*	28619	118591	190962	235130	262088
14	318	31964*	30387	125913	202742	249625	278237

\*See paragraph #4, page C-1.

TABLE 2- 764  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
WOOD WORKERS--SUPERVISORY  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
3	358	35630	33875	140384	226076	278389	310328
4	377	30598 *	29092	120571	194187	239139	266589
5	454	34385 *	32700	135599	218515	269222	300235
6	502	40033	38070	157848	254340	313333	349402
8	577	40116	38144	158113	254693	313693	349739
10	676	41170	39160	162444	261876	322745	360012

\*See paragraph #4, page C-1.

TABLE 2- 771  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MARINE EQUIPMENT REPAIRMEN--GENERAL LABOR  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
5	322	22679	21569	89446	144153	177616	198088
6	322	29669	28215	117001	188543	232294	259053
7	322	27447*	26104	108263	174490	215007	239799
9	322	33982	32318	134020	215979	266106	296768
10	322	31337*	29806	123632	199290	245595	273938
12	322	39989	38031	157707	254149	313132	349210
13	322	36736*	34938	144892	233515	287726	320892
14	322	36497*	34704	143866	231765	285475	318297
15	322	38352*	36467	151165	243504	299915	334380

\*See paragraph #4, page C-1.

TABLE 2- 772  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MARINE EQUIPMENT REPAIRMEN--WAGE LEADER  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
8	323	41838	39791	165036	266004	327783	365589
9	323	49660	47230	195871	315679	388969	433808
10	323	41204 *	39192	162578	262092	323012	360309
12	323	43374 *	41248	171029	275587	339514	378604
13	323	43286 *	41153	170546	274649	338200	377000
14	323	46658 *	44358	183814	295995	364466	406262
15	323	43673 *	41521	172065	277089	341199	380337
16	323	49888	47429	196543	316497	389715	434410
17	323	55684	52937	219346	353181	434848	484686

\*See paragraph #4, page C-1.

TABLE 2- 773  
 PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
 MARINE EQUIPMENT REPAIRMEN--NON-SUPERVISORY/SCHEDULING  
 (WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
10	323	26781	25459	105482	169832	209091	233046
13	323	38962	37048	153574	247391	304710	339732



TABLE 2- 774  
 PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
 MARINE EQUIPMENT REPAIRMEN--SUPERVISORY  
 (WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
7	540	56273	53531	222110	358153	441489	492544
8	569	39994*	38029	157640	253939	312772	348719

\*See paragraph #4, page C-1.

TABLE 2- 780  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MISC. MECHANICS AND REPAIRMEN--APPRENTICE  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	320	17168	16324	67665	108996	134245	149670
2	320	21129	20092	83297	134200	165311	184327
3	320	18781*	17857	74015	119217	146826	163690
4	320	21734	20667	85685	138049	170055	189618
5	320	22146	21059	87303	140648	173246	193169
6	320	23337	22190	91986	148182	182517	203498
7	320	24841	23620	97906	157707	194238	216555
8	320	25311	24067	99755	160679	197891	220623

\*See paragraph #4, page C-1.

TABLE 2- 781  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MISC. MECHANICS AND REPAIRMEN--GENERAL LABOR  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	320	16728	15908	65956	106273	130919	145987
2	320	24855	23656	98268	158650	195756	218562
3	320	25561	24306	100767	162344	199977	222979
5	320	24171*	22987	95321	153608	189254	211056
6	320	27117	25787	106919	172273	212225	236651
7	320	28739	27332	113351	182684	225097	251045
8	320	29182	27754	115106	185520	228600	254959
9	320	32468	30879	128062	206396	254317	283636
10	320	32102*	30530	126607	204037	251397	280368
11	320	34855	33149	137472	221552	272984	304447
12	320	36636	34842	144485	232846	286890	319948
13	320	36899	35091	145508	234475	288879	322151
14	320	31259*	29725	123241	198562	244601	272744

\*See paragraph #4, page C-1.

TABLE 2- 782  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MISC. MECHANICS AND REPAIRMEN--WAGE LEADER  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
5	318	32611	31013	128594	207215	255288	284686
6	318	38994	37082	153760	247760	305233	340377
7	318	41519	39488	163774	263963	325260	362768
8	318	41166*	39154	162405	261786	322608	359835
9	318	43502	41378	171646	276710	341028	380406
10	318	43335*	41218	170977	275621	339673	378884
11	318	43481*	41353	171495	276388	340552	379806
12	318	45144	42930	177998	286802	353316	393983
13	318	41951*	39884	165284	266175	327765	365368
14	318	44552*	42357	175531	282676	348084	388017
15	318	45976	43711	181147	291725	359233	400450
17	318	45232*	43002	178191	286934	353302	393811

\*See paragraph #4, page C-1.

TABLE 2- 783  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MISC. MECHANICS AND REPAIRMEN--NON-SUPERVISORY/SCHEDULING  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
5	318	26938	25620	106255	171254	211018	235349
7	318	25296*	24061	99816	160918	198327	221233
8	318	33790	32135	133264	214766	264617	295111
9	318	32352*	30759	127483	205322	252853	281880
10	318	32613*	31008	128518	206996	254923	284194
11	318	34808	33095	137168	220927	272077	303317
12	318	34439*	32743	135693	218525	269094	299969

\*See paragraph #4, page C-1.

TABLE 2- 784  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MISC. MECHANICS AND REPAIRMEN--SUPERVISORY  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
3	363	31483	29931	124032	199731	245936	274141
4	384	33311	31672	131271	211433	260389	290290
5	469	38405	36526	151481	244137	300820	335498
6	491	37874 *	36018	149360	240693	296549	330712
7	527	43928	41777	173253	279216	344032	383683
8	555	37877 *	36015	149286	240473	296177	330209

\*See paragraph #4, page C-1.

TABLE 2- 790  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MISC. PRODUCTION WORKERS--APPRENTICE  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	319	19312	18363	76125	122637	151058	168427
2	319	20875	19850	82298	132592	163333	182123
3	319	19940*	18961	78604	126631	155977	173912
4	319	21713	20647	85600	137914	169888	189433
5	319	22873	21749	90162	145249	178909	199480
6	319	24526	23321	96669	155720	191794	213835
7	319	25282	24039	99642	160501	197676	220387
8	319	26252	24961	103459	166640	205228	228798
10	319	22427*	21323	88369	142320	175261	195376
13	319	19395*	18441	76436	123115	151625	169039
15	319	19386*	18432	76399	123056	151552	168958

\*See paragraph #4, page C-1.

TABLE 2- 791  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MISC. PRODUCTION WORKERS--GENERAL LABOR  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	319	18198	17306	71764	115643	142476	158887
2	319	18390	17491	72544	116928	144086	160706
3	319	20870	19849	82325	132691	163509	182368
4	319	22022	20941	86814	139861	172279	192093
5	319	24726	23515	97511	157139	193605	215909
6	319	26147	24865	103099	166126	204661	228223
7	319	28594	27194	112782	181769	223972	249793
8	319	29024	27603	114469	184478	227298	253493
9	319	32044	30476	126390	203701	250996	279933
10	319	33579	31937	132458	213493	263074	293414
11	319	34082	32414	134422	216636	266924	297688
12	319	34525	32835	136169	219452	270394	301558
13	319	38121	36252	150315	242209	298393	332748
14	319	36927*	35112	145556	234483	288818	322020

\*See paragraph #4, page C-1.



TABLE 2- 792  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MISC. PRODUCTION WORKERS--WAGE LEADER  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
3	318	26627	25314	104901	168926	208007	231864
4	318	28330	26936	111646	179826	221466	246900
5	318	28439	27048	112179	180805	222793	248485
6	318	40778	38779	160794	259093	319194	355944
7	318	39993*	38038	157764	254289	313353	349498
8	318	42037	39982	165831	267296	329386	367335
9	318	44036	41884	173734	280053	345126	384957
10	318	43848*	41706	172998	278874	343680	383351
11	318	43174*	41060	170269	274395	338080	377034
12	318	53224	50610	209815	338020	416367	464250
13	318	41722*	39666	164385	264730	325989	363391
14	318	42974*	40855	169301	272627	335694	374191
15	318	43804*	41645	172578	277912	342210	381462

\*See page #4, page C-1.

TABLE 2- 793  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MISC. PRODUCTION WORKERS--NON-SUPERVISORY/SCHEDULING  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
6	318	29179	27751	115095	185503	228579	254936
7	318	33525	31884	132221	213084	262543	292798
8	318	36091	34323	142325	229350	282568	315115
9	318	33360*	31717	131444	211686	260676	290588
10	318	33671*	32012	132669	213660	263108	293300
11	318	38746	36837	152654	245833	302714	337440

\*See paragraph #4, page C-1.

TABLE 2- 794  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MISC. PRODUCTION WORKERS--SUPERVISORY  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	369	33077	31445	130293	209792	258303	287907
2	369	31418*	29871	123799	199382	245531	273711
3	369	33940	32271	133756	215441	265331	295805
4	392	33730*	32069	132908	214050	263593	293845
5	485	39806	37858	156999	253024	311762	347696
6	500	39473*	37538	155649	250807	308990	344569
7	539	48124	45769	189818	305932	376969	420432
8	571	39747*	37792	156649	252326	310769	346472
10	667	40223*	38256	158670	255750	315153	351507

\*See paragraph #4, page C-1.

TABLE 2- 795  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
MISC. PRODUCTION WORKERS--LITHOGRAPHIC  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
2	318	18910	17984	74571	120165	148045	165095
4	318	21927	20850	86436	139252	171526	191251
5	318	21683*	20622	85526	137842	169846	189428
6	318	25636	24379	101092	162902	200699	223813
7	318	25971	24701	102449	165127	203479	226948
8	318	28908	27495	114040	183816	226514	252644
9	318	29148	27723	114992	185360	228426	254785
10	318	29869	28411	117851	189983	234137	261169
11	318	30246	28767	119313	192311	236977	264311
12	318	30453	28964	120132	193635	238612	266137
13	318	28945*	27522	114081	183763	226331	252337
14	318	28972*	27547	114187	183933	226538	252566
15	318	29857*	28387	117651	189484	233345	260130
16	318	28975*	27549	114180	183897	226470	252470
17	318	30432*	28934	119916	193130	237834	265134
18	318	30923	29400	121847	196237	241659	269396

\*See paragraph #4, page C-1.

TABLE 2- 801  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
VEHICLE OPERATORS--GENERAL LABOR  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	320	22139	21051	87262	140566	173131	193027
2	320	17055*	16221	67285	108462	133663	149089
3	320	20536*	19529	80971	130466	160723	179222
4	320	20879*	19853	82297	132571	163286	182053
5	320	25796	24531	101719	163910	201936	225190
6	320	27042	25717	106636	171833	211698	236076
7	320	29559	28113	116592	187913	231547	258244
8	320	31175	29648	122952	198147	244139	272274
9	320	31957	30391	126030	203101	250238	279070
10	320	32748	31145	129167	208175	256507	286077
11	320	34519	32828	136124	219354	270249	301375
12	320	33367*	31733	131590	212062	261278	291381
13	320	37031	35217	146037	235340	289956	323361

\*See paragraph #4, page C-1.

TABLE 2- 802  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
VEHICLE OPERATORS--WAGE LEADER  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
4	318	31454	29905	123927	199571	245748	273939
5	318	35865	34105	141406	227839	280675	312978
6	318	37523	35684	147964	238425	293738	327562
7	318	39289	37366	154959	249737	307712	343180
8	318	41203	39187	162519	261932	322749	359959
9	318	44192	42031	174328	280988	346255	386197
10	318	44623	42442	176039	283758	349678	390024
11	318	43690*	41549	172284	277620	342029	381417
12	318	43286*	41163	170665	274980	338746	377730
13	318	42173*	40094	166144	267542	329431	367209
14	318	43777*	41620	172467	277727	341974	381192
15	318	44390*	42202	174887	281633	346794	386573

\*See paragraph #4, page C-1.

TABLE 2- 803  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
VEHICLE OPERATORS--NON-SUPERVISORY/SCHEDULING  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
5	318	28272	26887	111496	179676	221373	246877
6	318	29990	28521	118274	190603	234839	261897
7	318	28152*	26772	111009	178876	220372	245747
8	318	33424	31786	131799	212375	261642	291769
9	318	28117*	26730	110758	178339	219580	244749
10	318	33722	32061	132859	213952	263451	293670
11	318	33180*	31546	130729	210527	259242	288983
12	318	37404	35560	147352	237273	292153	325649

\*See paragraph #4, page C-1.

TABLE 2- 804  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
VEHICLE OPERATORS--SUPERVISORY  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
6	480	39062	37146	154008	248138	305677	340852
8	540	35712*	33956	140742	226695	279194	311262

\*See paragraph #4, page C-1.



TABLE 2- 811  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
LOGISTICS WORKERS--GENERAL LABOR  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	318	19075	18137	75175	121086	149128	166256
2	318	23717	22552	93495	150626	185541	206881
3	318	22196*	21106	87504	140980	173663	193641
4	318	21005*	19973	82799	133385	164294	183182
5	318	24429	23230	96313	155178	191158	213153
6	318	27463	26117	108294	174504	214988	239744
7	318	30291	28808	119475	192555	237262	264614
8	318	31599	30052	124625	200842	247460	275976
9	318	30298*	28814	119496	192581	237287	264636
10	318	41092	39076	162017	261052	321593	358607
11	318	37601*	35764	148345	239127	294688	328697

\*See paragraph #4, page C-1.

TABLE 2- 812  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
LOGISTICS WORKERS--WAGE LEADER  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
2	318	22540	21431	88830	143079	176213	196451
3	318	28585	27177	112634	181400	223387	249026
4	318	30534	29030	120309	193757	238599	265980
5	318	34743	33039	136988	220725	271918	303217
6	318	38181	36310	150558	242606	298889	333306
7	318	38743	36848	152825	246317	303518	338519
8	318	41680	39640	164396	264955	326472	364110
9	318	46331	44065	182757	294562	362969	404828
10	318	45763*	43523	180502	290914	358460	399787
11	318	44054*	41894	173705	279890	344809	384502

\*See paragraph #4, page C-1.

TABLE 2- 813  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
LOGISTICS WORKERS--NON-SUPERVISORY/SCHEDULING  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
3	318	23751	22582	93591	150734	185627	206936
4	318	27419	26075	108116	174211	214621	239331
5	318	30357	28869	119702	192881	237624	264983
6	318	31685	30132	124948	201346	248064	276636
7	318	33615	31967	132549	213581	263125	293419
8	318	65148	61941	256710	413443	509145	567586

TABLE 2- 814  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
LOGISTICS WORKERS--SUPERVISORY  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	367	30506	29002	120188	193548	238329	265668
2	367	32672	31063	128742	207347	255344	284655
3	367	31038*	29509	122290	196941	242514	270339
4	389	38078	36201	150014	241572	297456	331570
5	478	37139*	35320	146471	236049	290838	324353
6	493	37762*	35910	148897	239921	295573	329602
7	530	46215	43951	182259	293714	361878	403571
8	594	38321*	36436	151024	243259	299596	334010
10	700	43755*	41615	172604	278212	342835	382383

\*See paragraph #4, page C-1.

TABLE 2- 820  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
INSTALLATION MAINTENANCE--APPRENTICE  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	319	18252	17353	71914	115814	142615	158978
2	319	20184	19192	79561	128169	157869	176018
3	319	19806*	18832	78059	125734	154855	172644
4	319	20776	19755	81895	131932	162506	181191
5	319	21892	20816	86286	138992	171189	190860
6	319	22897	21771	90238	145350	179013	199576
7	319	23948	22769	94373	152003	187198	208694
8	319	25223	23981	99390	160073	197127	219754

\*See paragraph #4, page C-1.

TABLE 2- 821  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
INSTALLATION MAINTENANCE--GENERAL LABOR  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	319	18599	17686	73327	118142	145534	162278
2	319	19792	18822	78046	125765	154945	172789
3	319	21979	20901	86653	139612	171981	191768
4	319	22548	21439	88865	143141	176293	196546
5	319	24817	23600	97847	157654	194214	216566
6	319	28216	26834	111273	179313	220923	246372
7	319	27707*	26351	109277	176109	216987	241993
8	319	30255	28774	119334	192327	236980	264300
9	319	30215*	28734	119139	191970	236497	263723
10	319	31425	29885	123926	199705	246047	274390
11	319	34385	32701	135609	218544	269271	300301
12	319	33953*	32287	133858	215664	265664	296228
13	319	30535*	29041	120440	194113	239183	266759
14	319	36337	34552	143225	230716	284168	316826
15	319	33615*	31958	132434	213262	262599	292715

\*See paragraph #4, page C-1.

TABLE 2- 822  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
INSTALLATION MAINTENANCE--WAGE LEADER  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	317	25779	24510	101581	163602	201473	224599
2	317	29258	27816	115277	185646	228606	254836
3	317	30626	29118	120671	194337	239312	266772
4	317	28312*	26917	111553	179651	221226	246611
5	317	34468	32778	135903	218973	269756	300804
6	317	36677	34880	144638	233081	287168	320248
7	317	38122	36256	150361	242333	298595	333016
8	317	40890	38889	161292	259964	320335	357276
9	317	42752	40663	168666	271881	335051	373717
10	317	43991	41840	173541	279729	344711	384482
11	317	40994*	38986	161672	260540	321010	357997
12	317	43616*	41476	171963	277069	341318	380596
13	317	42008*	39937	165490	266484	328123	365746
14	317	43667*	41514	172027	277011	341087	380198
15	317	46399	44111	182785	294326	362398	403945
16	317	52277	49702	205981	331727	408500	455376
17	317	50785*	48280	200057	322137	396638	442109

\*See paragraph #4, page C-1.

TABLE 2- 823  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
INSTALLATION MAINTENANCE--NON-SUPERVISORY/SCHEDULING  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	317	18146	17252	71502	115156	141810	158087
2	317	22252	21157	87691	141241	173944	193919
3	317	25043	23810	98680	158930	195719	218186
5	317	27588	26236	108797	175328	216017	240905
6	317	32758	31153	129180	208164	256463	286001
7	317	34393	32707	135612	218512	269195	300184
8	317	32813*	31205	129390	208496	256865	286443
9	317	30861*	29341	121590	195806	241111	268770
10	317	31420*	29872	123790	199349	245473	273631
11	317	34953	33231	137714	221775	273091	304420
14	317	36951	35130	145579	234432	288669	321777

\*See paragraph #4, page C-1.



TABLE 2- 824  
PRESENT VALUE OF LIFE CYCLE BILLET COSTS FOR:  
INSTALLATION MAINTENANCE--SUPERVISORY  
(WB)

GRD	(UNDISCOUNTED)		YEARS IN LIFE CYCLE				
	INITIAL BILLET COST	ANNUALLY RECURRING COST	1	5	10	15	20
1	363	34436	32739	135667	218467	260007	299857
2	363	32113 *	30530	126516	203734	250868	279641
3	363	27021 *	25688	106437	171379	211007	235189
4	384	32371 *	30777	127542	205394	252919	281935
5	469	37137	35319	146467	236044	290834	324351
6	505	34703 *	33000	136808	220407	271497	302724
7	544	44011	41855	173562	279696	344603	384303
8	609	40618 *	38620	160078	257842	317556	354032
10	719	45917	43671	181120	291919	359708	401187

\*See paragraph #4, page C-1.

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